The Canadian Medical Association Journal

SEPTEMBER 15, 1957 • VOL. 77, NO. 6

PSYCHOLOGICAL ASPECTS OF RHEUMATOID ARTHRITIS*

B. M. CORMIER, M.D. and
E. D. WITTKOWER, M.D.
With the assistance of
YVES MARCOTTE, L.Ps. and
FRANCOISE FORGET, M.S.S., *Montreal, Que.*

THE VIEW is gradually gaining ground that rheumatoid arthritis is multicausal in origin. Undue emphasis on any specific factor, such as focal infection, exposure to dampness, heredity, constitution or psychogenesis, fails to do justice to the complexity of the problem. Rheumatoid arthritis, in the view of the authors of this article, is a stress disease and represents a maladaptation to psychobiological stress.

The present study concerning the relevance of emotional factors to the etiology of rheumatoid arthritis has been undertaken because (a) no medical theory adequately accounts for the etiology of this illness, (b) initial hopes of a radical cure of the disease by hormonal compounds have not materialized, and (c) abundant evidence has been submitted in favour of the significance of emotional factors for the onset of the disease, its perpetuation and its relapses.

Our study differs from other psychiatric studies in this area in so far as the siblings of the patients have been used as controls. The focus of the present study has been on one segment of the psychological parameter, namely, on the manner in which patients suffering from rheumatoid arthritis (r.a. patients) deal with their aggressive impulses as compared with their nearest sibling.

BRIEF SURVEY OF LITERATURE

The psychiatric and psychoanalytic literature on rheumatoid arthritis during the past two decades can be summarized as follows:

Nissen and Spencer[13] (1935) pointed out that r.a. patients escape from emotional conflicts through physical or somatic function rather than through fantasy, as schizophrenic patients do.

Thomas[16] (1935) showed in his patients that "a fairly severe emotional disturbance of one kind or another had been present before any sign of rheumatoid arthritis". In his series (31 cases) depressive syndromes are often the important clinical findings. He also found that, in general, the sexual adjustment of rheumatoid arthritics was inadequate.

Booth[2] (1937) mentioned, among other predispositions to chronic arthritis, an urge to be active and an inaptitude to pursue this activity on account of a neurotic defensive attitude.

Halliday[6-8] (1937, 1942) found that r.a. patients tend to show marked restriction of emotional expression and that they are apt to show strong elements of self-sacrifice. He noted that compulsive drives and obsessional trends long antedated the onset of the disease.

Gregg[5] (1939) made a survey of arthritic patients in mental hospitals and was struck, as were Nissen and Spencer (1935), by the relative absence of arthritis among psychotics.

Gordon[4] (1939) and McGregor[11] (1939) demonstrated the relevance of emotional factors to the onset, evolution and exacerbation of rheumatoid arthritis.

Cobb, Bauer and Whiting[3] (1939) made a study of 50 r.a. patients by means of evolving life charts to show the chronological relationships between various events in the lives of the patients and their illness. Their conclusions were that "environmental stress, especially poverty, grief and family worry, seems to bear more than a chance relationship to the onset and exacerbation of rheumatoid arthritis".

Ripley, Bohnengel and Milhorat[15] (1943) felt that the problem of how emotional stress is related to rheumatoid arthritis remains unsettled, but that the field is worthy of further investigation.

Blom and Nicholls[1] (1954) studied a series of children suffering from rheumatoid arthritis. An outstanding feature in the personality structure of these children was a conflict arising from their inability to achieve emotional separation from their mothers.

Meyer[12] (1956) showed that the outbreak of rheumatoid arthritis appears to follow events which upset the equilibrium between the aggressive impulses and their control.

*From the Allan Memorial Institute of Psychiatry, McGill University, Montreal, Que.

This study was made possible by a Dominion-Provincial Mental Health grant and was also partially supported by a grant from the Empire Rheumatism Council.

Few psychoanalytic reports on r.a. patients are available. Groddeck (1928) reported a case of "a woman with spinal arthritis in whom the disease seemed to be a defence against the heterosexual role" (quoted by F. Alexander). Alexander also quoted a case of MacFarlane's in which the symptoms of arthritis had the double meaning of a punishment for the patient's hostile competitive feelings towards men and atonement for her favourite activity – dancing – of which her father disapproved.

Johnson, Shapiro and Alexander[9] (1947) studied 33 r.a. patients of whom 29 were female. They concluded that the majority of these patients learned to discharge hostility through masculine competition, physical activity and servitude, and also through domination of the family. When these methods of discharge are blocked, the increased muscle tonus resulting from inhibited aggression and defence against it precipitates the illness. The authors felt, however, that since these factors are commonly found in patients who do not suffer from arthritis, additional etiological factors would have to be postulated.

Ludwig[10] (1954), reporting on material collected from eight psychoanalytically studied patients seen for several hundred hours each, found a personality pattern which was constant for all the patients studied. Yet the personality pattern observed has also been noted in patients with other psychosomatic disorders and is closely similar to that described by Kardiner in individuals with chronic traumatic neuroses incurred in war. Ludwig states: "The outstanding feature is marked impairment of ego function, manifested by extreme dependence, insecurity, feelings of inadequacy, difficulty in the usual methods of mastering or coping with the environment and with other people, and severe blocking of the external expression of emotion with internalization of feeling and autonomic activity." Ludwig stresses in his writings the presence of depressive features in these cases, but is inclined to classify them psychodynamically in the schizophrenic group and to compare the chronic r.a. patient with the catatonic schizophrenic patient.

MATERIAL AND PROCEDURE OF EXAMINATION

It is generally agreed that it is an almost insurmountable task to find a suitable control series in psychosomatic research because on comparison of two groups, however carefully the control series is matched, there are inevitably uncontrollable variables which defy statistical calculation.

We felt that by comparing two siblings of the same sex (where possible), and as near in age as possible—one suffering from rheumatoid arthritis and the other free from this illness—we reduced the number of variables to a minimum. We realize, of course, that even such a comparison of siblings does not eliminate genetic dissimilarities and different prenatal and postnatal conditions, and also that the healthy sibling, though free from the illness at the time of the examination, may develop it at some future date.

The patients who form the basis of this study represent an unselected sample of r.a. patients attending the out-patient clinic of the two teaching hospitals of McGill University, i.e. the Royal Victoria Hospital and the Montreal General Hospital. A few were private patients of the attending staff. In all patients the diagnosis of rheumatoid arthritis was well established. Altogether, 25 patients were seen. Of these 25, it was possible to see 18 corresponding siblings, and therefore we are reporting only on these 18 pairs. Both the patients and the siblings were seen first by a medical social worker who took a social history and made arrangements then for them to have an interview with a psychiatrist and a psychologist. The psychiatric evaluation consisted in taking from the patient and from the sibling a detailed psychiatric history with special attention to relevant emotional factors related to the onset of the illness. A detailed history was taken of different periods of their lives, i.e. early childhood, childhood, latency period, puberty, adulthood, and menopause and post-menopause when applicable.

The patients and their siblings were subjected to from three to ten one-hour interviews. On completion of the examination a personality formulation was drawn up, using the psychoanalytical frame of reference. Another formulation of their personality was obtained independently through psychological techniques including the Rorschach and the thematic apperception (T.A.T.) tests.

As stated before, the present article is focused on the manner in which the patients and their siblings dealt with their aggressive impulses.

DESCRIPTION OF PATIENTS STUDIED

The age of the patients studied ranged from 20 to 60. Ten were women and eight were men. Six patients were in their 50's, seven in their 40's, three in their 30's, and two in their 20's. In most of the pairs the control sibling was the nearest sibling of the same sex. The difference in age between the siblings was one to three years in 14 pairs, and five to seven years in four pairs. In four pairs the control sibling was not

TABLE I.—DEGREE OF INVALIDISM OF THE PATIENTS STUDIED

	Patient	*Age*	*Sex**	*Marital† status*	*Duration of illness (years)*
Group 1					
Total invalidism; chronic evolution	B.C.	42	F	M-D	12
	I.D.	54	F	S	30
	A.T.	54	F	S	34
	M.D.	50	F	S	10
	F.K.	59	F	M-Sep-W	9
Group 2					
Semi-invalidism; patient self-sufficient within limits, e.g. able to earn or to keep household	J.A.	55	F	M	5
	F.K.	43	F	S	10
	S.C.	40	M	M	13
	R.B.	24	F	M	5
Group 3					
No serious handicaps between recurrent attacks	L.D.	47	M	M	7
	B.T.	24	M	S	1
	M.L.	50	M	S	20
	R.L.	37	F	M	6
	A.T.	47	M	W	25
	R.S.	47	F	M-W-RM	3
	L.G.	31	M	M	2
	S.B.	32	M	M	18
	G.M.	42	M	M-Sep	20

* F = Female; M = Male.
† M = Married; D = Divorced; S = Single; Sep = Separated; W = Widow; RM = Remarried.

of the same sex. In two of these four families there were only two children; in the third family the difference in age between the patient and his nearest sibling of the same sex was too great; and in the fourth family the nearest sibling of the same sex was not available. The duration of time between the arthritic patient's first attack and the time when he was seen varied from one to 20 years. As the severity of the illness is not necessarily proportional to its duration, we have classified our patients in three groups, taking into account the severity of the illness and the degree of invalidism (Table I).

Because the patients were first seen during convalescence or, at any rate, when free from acute symptoms, very few of them were on active treatment at the time of examination. The nature of the treatment given was purposely disregarded in our study because (a) it had greatly varied in many patients during the long span of their illness, and (b) none of the therapeutic procedures, apart from cortisone, are known to influence the patient's state of mind directly. Two patients were on cortisone when seen.

A. General Findings

(a) *Motor Activity and Aggression in Childhood and During Puberty*

Motor activity, if not overactivity, and impulsiveness were found to be dominant characteristics of the childhood and puberty of the r.a. patients. According to their accounts, they had often been regarded as overactive babies. Many of them had shown a good deal of initiative early in life. This need for motor activity was found to be later canalized into active participation in sports and games, not infrequently at the expense of interest in learning and intellectual pursuits.

In some of these individuals, motor activity assumed a disorderly pattern amounting to unruly behaviour. Three of the r.a. patients had been delinquents and had been sent to a reformatory school. Three others—obvious exceptions to the rule—were quiet, shy and inhibited. However, their manifest behaviour was in marked contrast to their competitive and aggressive fantasies. In these three cases control over aggressive drives seeking outlet in motor action seemed to have been acquired at a very early age.

The corresponding group of siblings—those not suffering from rheumatoid arthritis—showed opposite tendencies in their childhood and during puberty. They were, as a rule, quiet, shy, reserved, and conforming children. Many of them recalled that they had been envious of their active, lively and impulsive brothers and sisters. They displayed definitely less energy than their r.a. siblings as active participants in sports and games or any other type of motor activity, but

greater interest in such sedentary activities as reading or drawing.

Both groups tended to describe one or both parents as strict and rigid. Yet, whereas the arthritics were apt to regard parental demands as excessive and to react to them with impulsive defiance, the non-arthritics either uncomplainingly and unprotestingly accepted similar demands or bypassed them in an unprovocative manner. In most cases the future r.a. patients had got into trouble with their parents while their corresponding non-arthritic brothers and sisters got along with them happily.

(b) *Motor Activity and Aggression in Adulthood*

As r.a. siblings progress from puberty to adulthood, noticeable changes take place. Aggressive, offensive and unruly behaviour may still prevail for some time. Yet gradually and increasingly, as the demands of adulthood arise, restraint in motor discharge is accomplished not infrequently in an obsessional manner. Four of the patients studied presented symptoms of an obsessive-compulsive neurosis; others—the majority—displayed definite obsessive-compulsive character traits.

Among the character traits observed are obsessional striving to be punctual, tidy and perfectionistic. (Opposite traits of character were found in a minority.) Obsessional doubts and brooding are common manifestations of their inability to face a situation demanding immediate action. The externalization of aggression is replaced by self-sacrificing or forgiving attitudes as a reaction formation against display and acting out of aggressive drives. Over-emphasis on and concern about security provided by financial or material values is commonly found, and although many of them are actually poor the misery of poverty is aggravated by the symbolic meaning of money values.

Conversely, a shift from inhibition to disinhibition took place in the group of siblings not suffering from rheumatoid arthritis. After having been shy, self-conscious, obedient and accommodating as children, they gradually developed poise and self-confidence as they grew up. They learned to stand up for their rights, and rather than use reaction formations, as did their arthritic brothers and sisters, they dealt with their aggressive impulses by means of sublimation.

Occasional outbursts of rage were more common and more violent in the r.a. group than in the controls. Yet, while the non-r.a. siblings may flare up and "forget it", the r.a. siblings were apt to be harassed by feelings of remorse and guilt, and subject to obsessional ruminations. It almost appears as if, in deep layers of their mind, they had in fantasy inflicted such grievous harm on the objects of their aggression that their need for self-punishment and for restitution was imperative. Consequently it can hardly be surprising that even on a conscious level they had a greater tendency to curb their aggressive outbursts than had their non-r.a. brothers and sisters.

(c) *Clinical Example*

The D. family was composed of four members: the father, the mother, Paul (born in 1913, brother of the patient), and Jean (born in 1914, suffering from rheumatoid arthritis since 1943). The mother died in 1916; she committed suicide during a depressive psychotic illness. After his wife committed suicide, the father left his two children under the care of the grandparents, Paul being placed with the paternal grandparents and Jean with the maternal grandparents. The father took very little interest in the children afterwards. Two years later he remarried.

Jean. Jean, the patient, was two years old when her mother died and when she was placed with her maternal grandparents who, as she said, were old-fashioned. She felt very lonesome. There was no closeness and no display of affection in the home according to her account. She remembers having felt self-conscious about not being well dressed. She soon became a very disturbed child. Because she was destructive and because she stole, the patient, when 12 years old, was taken to the Mental Hygiene Clinic by her grandmother with a view to placing her in a reformatory school. It had been noted that she enjoyed sewing and embroidering, and that despite her unmanageable behaviour she excelled in these activities. At the Mental Hygiene Clinic, the patient was considered a child of superior intelligence with a mental age superior to her chronological age. However, her scholastic record was very poor. In view of the unsatisfactory situation at her grandparents' home, she was kept at the reformatory school for two years—"the best years of my life", she said. While there, she changed from an aggressive, destructive and delinquent child into an obedient, conforming child. After leaving the reformatory school she became an efficient worker. As she grew older she earned her living by sewing and embroidering. Her work record was good; she was a conscientious, meticulous worker. When she was 19, still hankering for a home and all it stands for, she married. Her husband was an irresponsible

person, unable to provide for the household. He was an habitual drinker and a compulsive gambler. The marriage ended in failure.

Jean's illness started when she took steps to obtain a legal separation. As she felt this to be an aggressive act against her husband, it provoked in her intense feelings of guilt and anxiety.

Comments: Owing to the early death of her mother and owing to her upbringing in the unsatisfactory environment of her grandparents' home, Jean was deprived of parental care and love early in life. Her response to this deprivation was, at first, a longing for an affectionate relationship. Afterwards, it is justifiable to assume, feelings of resentment and of vindictiveness motivated her aggressive and delinquent behaviour. Her antisocial behaviour came to an end at the reformatory school. The facts that she had become an inoffensive individual in adolescence and that she carried out her work activities in an obsessional, perfectionistic manner indicate (a) that her previously outwardly directed emotional economy had been turned inwardly, and (b) that, unrecognized by herself, she had found a new means of obtaining affection, namely, by hard work and flawless performance. Jean, by now, is an obsessional, ruminative person, brooding over her problems, hardly able to externalize aggression which is flimsily concealed by her attitude of resignation and forgiveness.

An impulsive, overactive, destructive, uncontrollable child had been transformed into a peaceful, law-abiding adult with marked obsessional characteristics.

Paul. Paul, who is a year older than Jean, was brought up by his paternal grandparents. Though, like his sister, he was also deprived of parental affection at an early age, he apparently received from his grandparents, and especially from an aunt, sufficient love and affection for his requirements. Because he lived with his father's parents, he saw his father quite frequently. When Jean was seen at the Mental Hygiene Clinic and was described by the maternal grandmother as an impulsive, destructive child, the paternal grandmother was also interviewed and described Paul as "a lovely child, an angel". Despite efforts on the part of the family to prevent the children from seeing each other, they met fairly frequently as they lived in the same district. According to Paul, Jean was a "tomboy" . . . "she could climb an appletree, she could fight and skate like any boy". She was very aggressive with Paul; he said that he received "a good walloping" from her. He was a shy, timid and sensitive boy.

As Paul grew older, especially at puberty, he became less inhibited and more active in his teenage gang which he led in some semi-delinquent activities. As an adult, he gambled, drank heavily and engaged in promiscuous activities. His marriage, like that of his sister, ended in failure. Paul obtained a divorce and remarried some years afterwards. His second marriage is moderately successful. Within recent years he has managed to keep out of serious trouble.

Comments: Paul, like his sister, showed marked signs of emotional immaturity; like her, he went short of affection as a child, though he felt, and probably was, less frustrated than she was. The paternal grandparents and his aunt were fairly satisfactory substitutes for his parents. He had enough contact with his father to allow him an identification of some sort.

The clinical example selected shows a striking difference in motor activity between these two siblings. Jean started her life by being a hyperactive, impulsive child suffering from an acting-out disorder, and eventually became an obsessional person. Paul, by contrast, started off by being an inhibited child and eventually became an impulsive individual suffering from an acting-out disorder. The extreme tendencies shown in this pair of siblings (overactivity in childhood and inhibition of motor activity in adulthood for Jean, and the reverse for Paul) was a tendency found to a variable extent in most of the pairs studied.

B. Details of Findings in 18 Pairs—Discussion

As has been shown, the most significant difference between the two groups of siblings studied has been the manner in which they dealt with their aggressive drives. The r.a. patients were inhibited in display of aggression (before their illness) whereas, by and large, no such inhibition existed in their non-arthritic brothers and sisters. As might be expected, the degree to which the two groups differed in this respect varied to some extent in the 18 pairs studied.

The difference between the two groups was particularly striking in three pairs of siblings. In these three pairs the emotional life of the r.a. sibling was reduced to obsessional ruminations of an aggressive content without any outward display of aggressiveness. The three corresponding non-arthritic siblings, by contrast, could be classed as impulsive neurotics. None of the three siblings who acted out their aggressive impulses neurotically suffered from psychosomatic illness or showed evidence of conversion hysterical somatization of conflict.

Twelve other non-r.a. siblings were found to be more capable of discharging their aggression outwardly than were their brothers and sisters who suffered from rheumatoid arthritis. The degree of this capacity to discharge aggression outwardly ranged from gross to minimal qualitative and quantitative differences.

The greater the inhibition of expression of overt aggressiveness in the non-r.a. siblings, the greater was their tendency to develop and to display obsessional features and psychosomatic symptoms. Of the 12 non-r.a. siblings in this group, three were suffering from migraine, one from obesity, one from essential hypertension, and one from ulcerative colitis.

In the remaining three pairs in whom no appreciable differences could be observed, inability to verbalize thought and feeling made a reliable comparison well-nigh impossible.

The findings thus far reported allow the following preliminary conclusions:

1. Persons who suffer from rheumatoid arthritis are characterized in their premorbid personality by a marked inability to give overt expression to aggressive drives.

2. Such inhibition is not noticeable, or at least not to the same extent, in their non-arthritic siblings.

3. Non-arthritic siblings who, similar to their arthritic brothers and sisters, are inhibited in expression of aggressiveness frequently suffer from psychosomatic ailments other than rheumatoid arthritis.

4. Psychosomatic ailments, such as eczema or migraine, not infrequently precede the onset of rheumatoid arthritis.

5. The choice of psychosomatic disorder, i.e. migraine versus rheumatoid arthritis, is probably determined by a multiplicity of factors of which one is the severity of the personality disorder. Siblings suffering *only* from migraine were somewhat better organized in their personality structure than those suffering first from migraine and afterwards from rheumatoid arthritis.

C. PSYCHOLOGICAL TESTS

Thirteen pairs out of the total of 18 were studied by means of psychological tests. An I.Q. was taken to allow a better comparison of the projective tests, particularly in cases where the siblings were of very different intellectual levels. The projective tests administered were Rorschach and T.A.T. For a variety of reasons only the Rorschach findings will be reported.

With a view to establishing the possible comparative difference between the patients suffering from rheumatoid arthritis and their non-r.a. siblings, we studied two points in the Rorschach: (1) the way in which psychic energy is liberated (whether in accordance with introversive or an extroversive tendency), and (2) the degree of restrictive control (repressive or constrictive control).

In eight pairs out of the 13 pairs studied there was a gross difference between the two groups under comparison. In all of them the patients suffering from rheumatoid arthritis showed pronounced signs of introversion with a repressive control, whereas their non-arthritic brothers and sisters showed a pronounced tendency towards extroversion. As the chief means of discharging his psychic energy, the r.a. sibling seemed to turn to his own inner life, and as a means of control he used repressive mechanisms. The non-r.a. sibling in this group of eight pairs, on the other hand, seemed to succeed easily in releasing his energies when required by external demands (promptings from without), and he used fewer repressive mechanisms.

In three of the remaining five pairs the personality differences were very slight. Both groups showed about the same degree of introversion or extroversion, and they all used repressive controls to the same extent. In two pairs the non-r.a. siblings showed introversive tendencies, but in these two pairs the siblings suffering from rheumatoid arthritis showed such strong repressive mechanisms that they completely hid any indication of a preponderant tendency to introversion or extroversion.

The psychological studies of these 13 pairs, when correlated with the clinical findings, closely corroborated the clinical assessment. When psychological testing showed minimal or no differences between the r.a. and non-r.a. siblings, the latter were found to be suffering from a psychosomatic illness other than rheumatoid arthritis.

It may be objected that the differences in Rorschach findings were due to the fact that one group of the subjects under investigation was suffering from an incapacitating illness whereas the other group was unrestricted in motor activity by illness. This argument is hardly valid because only two of the arthritic patients who were given the Rorschach were total invalids and three were semi-invalids. The other eight siblings in this group were capable of normal motor activity. Also, in the control group the siblings suffering from a psychosomatic illness other than rheumatoid arthritis present the same

signs of introversion with repressive control, though motor activity is unimpaired.

D. Correlation of Psychiatric Findings with the Onset and Evolution of Rheumatoid Arthritis

The natural history of rheumatoid arthritis varies a great deal. The illness may occur once in a lifetime and never again. It may appear in periodic attacks separated by asymptomatic periods with more or less residual damage, or it may take a chronic evolutive course from the beginning with irreversible change.

Attacks of rheumatoid arthritis are frequently precipitated by an overwhelming situation in which the conscious or unconscious urge to discharge aggressive impulses is counteracted by conscious or unconscious fear of the consequences and guilt over wrongdoing. The overwhelming situation is very often the loss of a highly valued, yet ambivalently regarded, person, the r.a. patient being unable to tolerate the aggression revived in the grief reaction.

The severity of the illness seems to be proportionate to the severity of the impairment in the capacity to express aggression.

In those r.a. patients in whom the illness took a chronic evolutive course from the beginning, it seems that the precipitating events were such that the emotional economy failed irreversibly, i.e. the previous homœostasis could not be re-established.

Representative of this type of chronic invalidism is the case of Miss H., aged 50. Since the beginning of her illness in her early 20's, she has been unable to support herself. The onset of her illness was precipitated by the death of her father. After his death she became unusually dependent on her mother. The mother's death, ten years after that of the patient's father, led to an acute exacerbation of the previously unspectacular dragging disease. Subsequently, again and again—in vain—she tried to find substitutes and replacements for her lost parents and for the security and love which they represented. Rejection—emotional desertion and desertion through death—by any of these substitutes was invariably followed by acute exacerbations of her rheumatoid arthritis. All available treatment has failed to bring tangible relief or remission in the course of her illness.

Different psychodynamics prevailed in those patients whose illness was characterized by *recurrent* attacks separated by relatively asymptomatic periods. These patients seemed to be able to re-establish, totally or partially, the mechanisms of defence which were operative before the overwhelming precipitating events occurred.

Representative of this type of case is Mr. C., aged 40. At the time of examination Mr. C. had suffered from rheumatoid arthritis for nearly 12 years. Though handicapped a great deal by his illness, he has not been crippled by it to such an extent as to interfere seriously with his capacity to earn his living. As a child he was aggressive, rebellious and stubborn to the point of being obstreperous. Afterwards he learned to control his aggressiveness, and was in fact inhibited to some extent in motor expression and in his ability to stand up for himself. The onset of his illness was precipitated by an increase in responsibility at work which he felt unable to face and by a serious accident which happened to him when he was performing his new duties. After the first attack of his illness was over, he asked to be demoted despite the substantial loss in income involved. Subsequently he returned to the previous level of his employment, on which he was able to function without much difficulty. He responded with violent feelings of anger to any situation which he regarded as a blow to his self-esteem, but did not attack his opponent either in action or even in words. He said to the interviewer: "I would really fight were it not for my handicapping illness." His illness, it is true, prevented him from using physical force, but obviously it did not prevent him from expressing his aggression verbally. The illness provided him with a convenient rationale for his inability to externalize aggression.

E. Therapeutic Implications of Findings

The contribution which the psychiatrist can make to the treatment of r.a. patients obviously varies with the state of the patient.

1. In the acute phases of the illness the role of the psychiatrist is necessarily limited. A person with acute pain, with swelling of the joints and a high temperature, is a poor candidate for psychiatric investigation. Exceptions to the rule are those patients whose illness has been precipitated by an acute and severe emotional disturbance. In such cases a psychiatrist may be called in to assess the patient's emotional state and to deal with the emotional crisis which may have arisen. This can usually be achieved by a series of brief interviews aimed at reassurance rather than at interpretation of deep-seated conflicts.

Typical of many other patients is the case of Mrs. L., aged 50, who was seen in an acute stage of her illness. When asked by the social worker employed

on this project whether mental upsets had something to do with the recurrent attacks of her illness, she replied: "The history of my illness fluctuates with my husband's illness."

The following history was obtained by the psychiatrist:

Mrs. L.'s husband has been seriously ill for the last three years; the possibility of cancer has been considered. He is an unskilled labourer. Even when he was still employed, Mrs. L. used to work as a charwoman to augment his meagre wages. According to herself, she had been a cheerful woman able to face adversity of any sort up to the time when her husband took ill. With the onset of his illness she became depressed and soon afterwards she was unable to work. Suicidal ideas appeared. A recurrent dream in which she sees her husband abandoning her for another woman has disturbed her greatly.

Shortly after the onset of her husband's illness, she started to suffer from rheumatoid arthritis.

Her grief can be understood in the light of her history. She was brought up in a poor family and was one of many children. At the age of 19 she married, very much against her wishes, a man of her father's choice. She was very unhappy in this first marriage despite relative material security; one reason for her unhappiness was her husband's jealousy. He died after they had been married for seven years. Soon after his death, she fell in love with her present husband, whom she married against her family's wishes. Her husband may not have given her financial security but up to the time of his illness he had given her emotional support which she badly needed. The possibility of losing him grieved her deeply; yet, at the same time, unrecognized by herself, she also resented what was to her a "desertion".

Psychotherapy during the acute phase of her illness consisted largely in reassurance. Arrangements were made to alleviate her precarious financial situation. The doctor who attended her husband put her mind at ease regarding her husband's condition. Gradually she regained her lost sense of security. When the acute phase of the illness was over, psychotherapy was shifted to a deeper level.

2. Measures prescribed during the recovery phase of the illness with the aim of restoring motility often fail. The failure of routine rehabilitative measures may be due to the fact that the motor handicaps are functional rather than structural in nature. Motor inhibition in patients suffering from rheumatoid arthritis, as has been pointed out above, is related to their inability to tolerate the upsurge of aggressive impulses. Analysis, even if only partial, of the emotional conflicts underlying the motor inhibition improves the chances of recovery and may prevent permanent disablement on functional grounds.

Illustrative of this kind of mechanism and its resolution is the case of Miss C., aged 50, who has suffered from rheumatoid arthritis for the past two years.

Six months before she had been hospitalized because of an exacerbation of her illness. When the acute symptoms subsided, the internist advised her to resume her work as a seamstress. This she refused to do owing to persisting aches and pains. Because, in the opinion of the internist, her handicaps were functional rather than structural in origin, psychotherapy was recommended.

When Miss C. came to see the psychiatrist she unburdened herself freely but failed to establish any connection between her emotional difficulties and her physical illness.

She had lost her father early in life and had spent most of her life with her mother, who had died during the year preceding her illness. Her ties to her mother had been very close. In fact, she had devoted herself to her mother to such an extent that she had never considered the possibility of marriage while her mother was alive. Though her mother had obviously been a millstone around her neck, the patient spoke of her in none but adoring terms. Her attitude towards her physician was a similar one. She could not find enough words of praise for his skill and kindness. Likewise, all physiotherapists with whom she had come into contact during her prolonged illness, according to her account, had been paragons of their profession. It was easy enough to recognize that this attitude of exaggerated gratitude and praise covered up a deep sense of resentment which could be better understood by an exploration of her relationship to her mother. It soon became evident that the mother had been over-possessive and over-protective towards the patient, whom she used as a crutch to lean on after her husband had died. It also became evident that, unrecognized by herself, the patient used her doctors as mother substitutes. Advice given to her to return to work was experienced by her as a rejection to which she responded by a display of helplessness and, rather illogically, by expressions of exaggerated gratitude and praise. Her conflict over aggressiveness in relation to her mother was too deeply buried to be exposed to the full; yet, as a result of the psychotherapy, the patient gained some insight into her hostility towards her physicians and physiotherapists whom she highly praised.

After the fourth interview, she was able to return to work but not before she could persuade the psychiatrist to accept a gift which was seen, but not interpreted, as a token of reparation for the aggression which she had been enabled to verbalize. Her aches and pains were still present but were less intense and less frequent than before.

3. Intense psychotherapy seems to be indicated for patients in whom emotional problems are found to be of crucial importance for the etiology and evolution of the disease. The type

of therapy to be given would obviously depend on the nature and severity of the personality disorder, on the insight of the patient and his willingness to undergo treatment, and on the treatment facilities available.

4. In all patients suffering from rheumatoid arthritis, awareness and understanding of the emotional problems underlying the illness and resulting from it on the part of all members of the therapeutic team seem to enhance the prospects of successful treatment.

SUMMARY AND CONCLUSIONS

1. The motor activity of 18 patients with rheumatoid arthritis (r.a.) has been compared with the motor activity of their nearest siblings free of the illness. The comparison shows that the r.a. patients are overactive as children but inhibited later in life (before their illness), whereas their siblings who are free of the illness start life with normal or inhibited motor activity and seem to be able to use their motor apparatus successfully for instinctual discharge later on in life.

2. Motor overactivity early in life in the r.a. patients seems to serve as an outlet for aggressive drives in a socially acceptable or unacceptable form. After puberty, overactivity is progressively abandoned as an inadequate means of expression of instinctual drives as well as a psychological defence against them. Deprived of discharge of instinctual tension in movement and impulsive action, the r.a. patients take recourse to aggressive fantasies which give rise to feelings of guilt and anxiety.

3. The intensification of these incompletely recognized, intolerable, aggressive fantasies (and the concomitant guilt and anxiety) by disturbing events in the patient's life history often precedes and probably precipitates the onset of rheumatoid arthritis.

4. The comparison of the Rorschach findings in 13 r.a. patients with the findings in the 13 nearest siblings free of the disease corroborated closely the clinical assessment.

5. The severity of the illness seems to be proportionate to the severity of the impairment in the capacity to express aggression.

6. The psychotherapeutic implications of these findings are discussed with clinical examples.

REFERENCES

1. BLOM, G. E. AND NICHOLLS, G.: *Am. J. Orthopsychiat.*, **24**: 588, 1954.
2. BOOTH, G. C.: *J. Nerv. & Ment. Dis.*, **85**: 637, 1937.
3. COBB, S., BAUER, W. AND WHITING, I.: *J. A. M. A.*, **113**: 668, 1939.
4. GORDON, R. G.: *Brit. M. J.*, **1**: 1165, 1939.
5. GREGG, D.: *Am. J. Psychiat.*, **95**: 853, 1939.
6. HALLIDAY, J. L.: *Brit. M. J.*, **1**: 213, 1937.
7. *Idem*: *Ibid.*, **1**: 264, 1937.
8. *Idem*: *Proc. Roy. Soc. Med.*, **35**: 455, 1942.
9. JOHNSON, A., SHAPIRO, L. B. AND ALEXANDER, F.: *Psychosom. Med.*, **9**: 295, 1947.
10. LUDWIG, A. O.: Rheumatoid Arthritis: *In*: Recent developments in psychosomatic medicine, edited by E. D. Wittkower and R. A. Cleghorn, Sir Isaac Pitman & Sons, London, 1954, p. 232.
11. MCGREGOR, H. G.: *Practitioner*, **143**: 627, 1939.
12. MEYER, B. C.: *Medicina Psicosomatica*, **1**: 13, 1956.
13. NISSEN, H. A. AND SPENCER, K. A.: *New England J. Med.*, **214**: 576, 1936.
14. PATTERSON, R. M. *et al.*: *Am. J. Psychiat.*, **99**: 775, 1943.
15. RIPLEY, H. S., BOHNENGEL, C. AND MILHORAT, A. T.: *Ibid.*, **99**: 781, 1943.
16. THOMAS, G. W.: *Ibid.*, **93**: 693, 1936.

RÉSUMÉ

L'activité motrice de 18 malades souffrant de rhumatismes chroniques inflammatoires fut comparée à celle de leurs plus proches frères ou soeurs. La comparaison a montré que ceux-là étaient hyperactifs pendant l'enfance et devenaient inhibés avec les années même avant de tomber malade, alors que ceux-ci au contraire commençaient par une activité motrice normale ou inférieure, et semblaient capables plus tard de se servir de leur appareil moteur pour satisfaire leurs impulsions. Cette hyperactivité du début chez les rhumatisants semble servir à l'extériorisation de tendances agressives sous une forme socialement acceptable ou inacceptable. Après la puberté, cette hyperactivité décline progressivement et ne sert plus comme un moyen d'expression des poussées instinctives ni comme défense psychologique contre elles. Privés de ce moyen de libérer leur tension instinctuelle par le mouvement et les actions impulsives, les malades atteints de rhumatisme ont recours à des fantasmes agressifs qui, par la suite, donnent naissance à des sentiments d'angoisse et de culpabilité. L'intensification de ces fantasmes agressifs intolérables et mal identifiés, de concert avec l'angoisse et la culpabilité qui les accompagnent, bouleversent la vie du malade, précèdent souvent et peuvent même déclancher le début de l'arthrite. Ces constatations cliniques furent corroborées par l'interprétation des épreuves de Rorschach de 13 rhumatisants compararée à 13 de leurs plus proches frères ou soeurs. La gravité de la maladie semble proportionnelle à leur incapacité à exprimer l'agression. Les auteurs se servent d'exemples cliniques pour discuter les implications de ces données.

TRAVELLING TO AUSTRALIA?

The General Secretary will be glad to be notified of the plans of any member of The Association who is contemplating a trip to Australia early in 1958. The Tenth Session of The Australasian Medical Congress will be held in Hobart, Tasmania, March 1-7, and The Association has been invited to nominate a representative.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

THE SURGICAL TREATMENT OF MASSIVE CEREBRAL HÆMORRHAGE

A REPORT OF 33 CASES

D. A. HOWELL,* M.B., M.R.C.P.(Lond.),
Montreal

THE HISTORY of surgical intervention in massive cerebral hæmorrhage is a long one. In 1888 Heusner[1] reported the complete recovery of a 13-year-old girl after "trephining" for a cerebral hæmatoma which developed as a complication of a mild head injury. These rare post-traumatic cases usually mimic extradural hæmorrhage so closely that surgeons are compelled to operate, but the scanty reports in the literature suggest that the majority of patients make excellent recoveries.

In 1903 Cushing[2] reported the first evacuation of a hæmatoma from a patient with spontaneous cerebral hæmorrhage, and in 1909 Russell and Sargent[3] recorded the first survival after such an operation. Since the papers of Kron and Mintz[4] (1927), Bagley[5] (1932) and Penfield[6] (1933), reports have become more frequent year by year. Though some patients were submitted to surgery because they were thought to be suffering from another cerebral disease, the results were sufficiently encouraging for surgeons, such as Ferey[7] (1950), to select patients deliberately for operation, especially those who had survived one or two weeks after the onset and were still in good condition. This author reported only eight deaths in 30 patients with massive cerebral hæmorrhage and no mortality in a further three patients with cerebellar hæmorrhage. There are many reports of smaller groups of patients, such as those of Beck[8] (1953) and Werner[9] (1954), in which the low mortality and good recovery after operation are impressive.

However, this common disease remains rare in the neurosurgical wards, and patients admitted to the medical wards differ from those reaching the neurosurgeon. They are usually much older and the majority suffer from arterial hypertension. Surgical intervention in hypertensive patients has proved more hazardous and less satisfactory; Perria[10] has reported 10 postoperative deaths in 11 such patients. In the medical wards massive cerebral hæmorrhage is commonly a fulminating disease, few patients surviving one or two weeks. Aring and Merritt[11] found that half their patients did not survive four days and Rose[12] reported that 80% of his patients were dead within 24 hours. While young patients with a normal blood pressure tend to survive longer after a massive cerebral hæmorrhage than the elderly hypertensive, it often proves rapidly fatal in these patients as well. Thus the excellent results reported after surgical treatment of cerebral hæmorrhage have been obtained only in a highly selected minority of the patients suffering from this disease.

*Montreal General Hospital, Pine Street, Montreal.

SELECTION OF CASES

The author is indebted to Mr. Wylie McKissock for permission to search his records at the National Hospital, Queen Square, London, Eng., and in the Neurosurgical Department of St. George's Hospital, London, and to report all surgically treated cases of massive cerebral hæmorrhage that were found. Cases were excluded if the hæmorrhage involved the diencephalon, brain stem or cerebellum or if there were complicating factors such as old or recent head injury, gross cerebral disease such as glioma or massive subdural hæmatoma as well as cerebral hæmorrhage. Thirty suitable cases were found in Mr. McKissock's records and the author is indebted to Mr. Harvey Jackson for permission to report another similar case and to Mr. Valentine Logue for two more. Except for some fatal cases from the earlier records, the author has seen most of the patients at one stage or another of their illness.

CASE REPORTS

A crude estimate of the size of the hæmatoma, based on an analysis of the clinical and radiological features and the operation report, is given in the case abstracts in Table I. In every instance it was thought to be larger than a chicken's egg, the average diameter being more than four centimetres. The hæmatoma in Case 1 was just about this size. In 17 cases the hæmatoma was called large because it appeared to have at least twice this volume and in the other 15 cases the hæmatoma was called very large because it was at least four times as big as a chicken's egg. The size of the hæmatoma was not one of the features in which these cases differed from those seen in the medical wards.

The level of consciousness is described in words defined in the Medical Research Council, Glossary of Psychological Terms,[13] if a reliable description of the patient's spontaneous mental activity or response to stimulation was available in the case record. Various terms describing levels of conciousness are often used loosely, and if the meaning is open to doubt they are placed in inverted commas in the case abstracts.

Adjectives have been used to describe the severity of hemiplegia and require definition. No voluntary movement is present in the affected limbs in "complete" hemiplegia. A little weak movement is present at a few joints in "very severe hemiparesis" and at all joints in "severe hemiparesis". Individual finger movement is present in "moderate hemiparesis". Enough weakness or spasticity is present in "mild hemiparesis" to cause a significant disability in the left arm or leg of the average right-handed patient. A "minimal hemiparesis" causes no disability in the left limbs of the average right-handed patient and is essentially a hemiparesis of signs rather than symptoms.

The 33 cases have been subdivided into four etiological groups. Arterial hypertension was the only demonstrated cause for the hæmorrhage in 13 patients. Five patients were proved to have ruptured berry aneurysms and one of these suffered also from hypertension. There were nine patients in whom arteriovenous malformations were shown on angiography and in a fourth group of six patients no underlying cause for the hæmorrhage was found. Hypertension appeared to be the most important factor influencing the outcome of treatment, and in discussing the results the 14 hypertensive patients (Group 1 and Case 15) will be considered separately.

SURGICAL INVESTIGATION AND TREATMENT

The majority of the patients were investigated by ventriculography or angiography or both methods. Angiography was not commonly used before 1949, and three of the patients in whom no cause for the hæmorrhage was found, as well as six of the hypertensive patients, were not subjected to this form of investigation. In five patients blood was aspirated from the hæmatoma in the course of ventriculography and in two patients (Cases 10 and 11) investigation was not continued further.

Blood was aspirated from the hæmatoma through a burr hole in 11 of the 14 hypertensive patients and in 8 of the 19 non-hypertensive patients. In all but 3 of the non-hypertensive group this was followed by craniotomy and evacuation of the hæmatoma, but never as a planned procedure in the hypertensive patients. However, in 3 of these the condition deteriorated rapidly after aspiration and the hæmatoma was evacuated as an emergency in an unsuccessful attempt to save their lives.

From Cases 2, 6 and 7 less than 10 c.c. of blood were aspirated altogether, a quantity adequate to confirm the diagnosis but not to reduce the size of the hæmatoma very much. Larger quantities of blood were aspirated from eight other patients treated by aspiration alone, this method being used repeatedly in Cases 4, 5 and 9.

The hæmatoma was evacuated at craniotomy without previous aspiration in 14 patients, including 3 with arterial hypertension.

The arteriovenous malformation was excised from all the patients in whom such an anomaly was demonstrated. One berry aneurysm was excised and in another instance the neck of an aneurysm was occluded with a tantalum clip.

THE SURGICAL MORTALITY

Seven of the 33 patients died shortly after surgical intervention. Six of these suffered from arterial hypertension, and though no control series of comparable cases is available there can be little doubt that most of them would have died if treated by conservative methods. The low mortality of just over 5% in the non-hypertensive group is particularly striking. The overall mortality of just over 21% for both groups of patients and of 43% in the hypertensive patients is low in comparison with the common view that this disease is almost invariably fatal.

The non-hypertensive patient (Case 16) died as a result of recurrent hæmorrhage at the time of operation. This was the only patient in the whole series who suffered this complication and in this instance it was provoked by inadvertently probing the aneurysm while the hæmatoma was being aspirated. The case histories suggest that brisk recurrent hæmorrhage and slow oozing of blood into the hæmatoma cavity is not a rare event before operation, and it surprising that it followed aspiration only once in this series. At craniotomy the surgeon has an opportunity to arrest all bleeding points after the hæmatoma has been evacuated.

(Text continued on page 551)

TABLE I.—CLINICAL ABSTRACTS OF CASES OF MASSIVE SPONTANEOUS CEREBRAL HÆMORRHAGE TREATED BY ASPIRATION OR EVACUATION OF THE HÆMATOMA.
GROUP 1—PATIENTS KNOWN TO HAVE HAD HIGH BLOOD PRESSURE.

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
1. D.J., fem., age 66, pianist. Small hæmatoma right frontal pole.	Occasional headache and spells of silence and staring during conversation for 4 months.	1941: An abrupt onset of seizures with jerking of the left limbs every 20 min., continuing for 6 days, was followed by confusion, headache and left severe hemiparesis. She made a good recovery after 15 days.	1. Ventriculogram 18th day. 2. Craniotomy and evacuation of hæmatoma, 18th day.	Uneventful. Minimal hemiparesis.	4 months later she was very well without symptoms or signs. Six months later she died of a large spontaneous hæmorrhage into the other hemisphere.
2. A.N., fem., age 59, clerk. Large deep right fronto-parietal hæmatoma.	None.	1948: An abrupt collapse without cause, fracturing the neck of the left femur, was followed by the gradual onset of "coma" within one hour. Five days later she was alert, mentally slow, with papillœdema and a complete left hemiplegia. She complained of headache.	1. Ventriculogram and aspiration of 5 c.c. of blood, 8th day. 2. Re-aspiration of 3 c.c. of blood, 9th day.	Progressive deterioration after first operation, becoming comatose in 12 hours and dying in 72 hours in spite of further aspiration and ventricular tapping. No autopsy obtained.	
				Postoperative	*Death*
3. H.S., male, age 41, blacksmith. Very large right temporo-parietal hæmatoma communicating with the ventricle.	Tinnitus and severe frontal headache worse with straining for 6 months.	1949: While at work he collapsed in "coma". He was found to have a complete left hemiplegia. Forty-eight days later he showed some mental impairment, intense papillœdema with blurred vision and a minimal loss of power and position sense in the left limbs.	1. Ventriculogram, 53rd day. 2. Craniotomy and evacuation of hæmatoma, 53rd day.	Slow, complete, physical recovery. Auditory hallucinations paranoid ideas prominent during his stay in hospital.	No abnormal signs 6 months later. He remained mentally abnormal and during the last 4 years has been admitted three times to a mental hospital for brief periods because of maniacal outbursts of temper.
4. G.T., fem., age 53, housewife. Very large subependymal, right fronto-parietal hæmatoma.	None	1949: While sitting in a chair, knitting, she collapsed in "coma". One hour later she was able to complain of severe headache and pain in the neck. She remained confused with a complete left hemiplegia and anæsthesia.	1. Aspiration of 30 c.c. of blood, cystogram and ventriculogram, 14th day. 2. Re-aspiration of 40 c.c. of blood, 20th day.	Very slight mental improvement only.	An apathetic, incontinent, hemiplegic dement lying in a chronic hospital bed 5 years later.
5. W.L., male, age 58, civil servant. Very large right temporo-occipital hæmatoma.	Severe headache for 2 days.	1950: Abrupt onset of "coma". In a few hours he was severely confused, nauseated and complained of headache. After 7 days he was alert, but fatuous and talkative. He showed a minimal right hemiparesis, sparing the face, and a left upper quadrantic visual field defect.	1. Right carotid arteriogram, 9th day. 2. Aspiration of 30 c.c. of blood and a cystogram, 12th day. 3. Re-aspiration of 30 c.c. of blood, 21st day.	Uneventful.	Returned to work 9 months later. He could then walk 6 miles, fast, with ease. Three years later he had retired and suffered rare major convulsions. He remained loquacious.
6. R.B., male, age 37, clerk. Very large, deep, right fronto-parieto-temporal hæmatoma.	None	1951: While carrying his 5-year-old daughter, he suddenly developed pins and needles and weakness of the left foot and this side became paralyzed and anæsthetic in a few seconds. Severe headache, vomiting, and confusion developed in a few minutes. He showed some mental recovery in 4 days but a complete hemiplegia persisted after 15 days.	1. Right carotid arteriogram, 12th day. 2. Aspiration of 10 c.c. of blood, 19th day.	Uneventful slow mental recovery. Hemiplegia remained severe.	Walking with a stick in 3 months. A major convulsion followed an attempt to return to work at 8 months. Nine months after discharge he died of a similar hæmorrhage into the left hemisphere. A large cyst was found in the right hemisphere at autopsy.

GROUP 1—*(Continued)*

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
7. R.P., fem., age 67, housewife. Large left frontal hæmatoma, communicating with the ventricle.	None. (Headache for 10 mos., pneumonia 4 mos. before followed by mild depression.)	1951: Headache, weakness of both legs and right arm and slurred speech was followed after about 3 days by intense headache, vomiting, drowsiness and incontinence. Bilateral hemiplegia complete in the right arm and sparing the left face was still present after 8 days. A slow recovery on about the 10th day. Kernig's sign was present.	1. Left carotid arteriogram, 12th day. 2. Ventriculogram, 19th day. 3. Aspiration of 5 c.c. of blood, 19th day.	Slow uneventful recovery. She showed a slight dysphasia and a minimal right hemiparesis after a month.	At 10 weeks there was no dysphasia, though a minimal hemiparesis remained after 11 months. She complained of headache, was anxious and lacking in energy.
8. M.P., fem., age 63, housewife. Large right fronto-parietal hæmatoma.	None.	1952: She suddenly fell "unconscious". She quickly recovered but could not speak. Left hemiplegia and coma developed slowly in the next 3 hours. Three days later she was drowsy, confused, disorientated and unaware of the severe left hemiplegia, hemi-anæsthesia and hemianopia she showed on examination.	1. Right carotid arteriogram, 4th day. 2. Aspiration of 5 c.c. of blood, 5th day. 3. Craniotomy and evacuation of hæmatoma, 6th day.	She became progressively more unconscious after the aspiration and died two days later in spite of evacuation of the hæmatoma. There was no evidence of fresh bleeding at craniotomy or at autopsy when there was little evidence of swelling of the hemisphere or hipocampal herniation. *Postoperative Death*	
9. G.B.W., male, age 53, civil servant. Very large, deep, right fronto-parieto-temporal hæmatoma.	None. (Acute anterior poliomyelitis in childhood left him with weakness of both legs. He walked with a stick. Two years previously he had been to bed for 3 months with a sudden total paralysis of both legs which recovered completely.)	1952: A sudden onset of clumsiness of the left hand and mental confusion while dressing, was followed in a few hours by a severe headache, dysarthria and left hemiplegia. He was profoundly confused and vomited. He improved by the 16th day but was still drowsy and incontinent. He rapidly became worse on the 17th day and unaware of his total hemiplegia. Papillœdema with hæmorrhages and exudates was noted.	1. Right carotid arteriogram, 21st day. 2. Ventriculogram, 21st day. 3. Aspiration of 25 c.c. of blood, 21st day. 4. Aspiration of 10 c.c. of blood 23rd day. 5. Aspiration of 5 c.c. of blood, 25th day. 6. Aspiration of 5 c.c. of blood, 28th day. 7. Aspiration of 4 c.c. of blood, 34th day	Slow improvement but he was able to walk out of hospital in a month.	He returned to work after few months. After 15 months he still noted a mild left-sided weakness and burning sensation, and he had had a brief episode of altitudinal hemi-anopia. After three years, his neurological symptoms remained the same but he now complained of dyspnœa on exertion.
10. A.T., male., age 65. Very large deep left fronto-temporo-parietal hæmatoma.	None.	1952: He was found in a cold bath in "coma" with a flaccid right hemiplegia. His condition steadily deteriorated in the next two days when Cheyne-Stokes respirations, pulmonary œdema, bradycardia of 40 and a large left pupil developed.	1. Aspiration of 20 c.c. of blood and tapping of the right lateral ventricle, 4th day.	He steadily deteriorated in spite of repeated ventricular tappings and died two days later. At autopsy it was apparent that only an insignificant quantity of blood had been removed and the left hemisphere remained greatly enlarged. *Postoperative Death*	
11. E.R., male, age 52, customs officer. Large left parietal hæmatoma.	None. (He was a chronic alcoholic who in the last 5 years had developed diabetes mellitus, polycythæmia vera, a myocardial infarction, and an attack of bronchopneumonia and delirium tremens.)	1952: After a sudden onset of severe occipital headache and vomiting, he was drowsy, confused and disorientated in a few hours. Fourteen days later his confusion increased and the left pupil dilated. Fifteen days after the onset a mild right hemiparesis was found.	1. Partial evacuation of hæmatoma by suction through a burr hole and cystogram, 15th day.	Slow steady improvement.	Four months later he was still improving. He was still unable to read or write, but no other disability remained. Further follow-up has not been obtained, there being no reply to any letters during the last 3 years.

GROUP I—(*Continued*)

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
12. D.D., male, age 45, insurance agent. Large right parietal hæmatoma.	Morning right frontal headaches, impaired concentration and depression for 12 months.	1952: He was awakened by the abrupt onset of very severe right frontal headache, requiring "Trilene" for its relief. Three days later he was better, but showed a little dementia and a left lower quadrantic visual field defect.	1. Right carotid arteriogram, 11th day. 2. Aspiration of 15 c.c. of blood and cystogram, 19th day. 3. Craniotomy and evacuation of hæmatoma, 19th day.	Fifteen minutes after the aspiration he was in coma with both pupils dilated and fixed to light. At the craniotomy the brain was very "tight", but there was no evidence of fresh blood in the hæmatoma. He lived in coma a further 16 days, but after the craniotomy the C.S.F. pressure in the ventricles and at lumbar puncture was very low. At autopsy there was no evidence of a recurrent cerebral hæmorrhage, but a large recent pontine hæmatoma was found.	*Postoperative Death*
13. T.C., male, age 44. Very large, deep, left fronto-parietal hæmatoma.	None.	1953: He was found in a state of drowsiness and confusion in a bus. A few hours later he was still drowsy, very dysphasic and had a severe right hemiparesis and dilated right pupil. His condition did not alter in the next three days.	1. Left carotid arteriogram, 1st day. 2. Aspiration of 12 c.c. of blood and cystogram, 3rd day. 3. Ventriculogram, 3rd day. 4. Craniectomy and partial evacuation of hæmatoma, 3rd day.	Fifteen minutes after aspiration he was also in coma with fixed dilated pupils, the left pupil dilating before right. The pressure was high at craniectomy but afterwards low in the ventricle and lumbar theca. He lived only 2 days. At autopsy there was no brain stem hæmorrhage or evidence of fresh bleeding. There was well-marked hypocampal herniation.	*Postoperative Death*

GROUP II—PATIENTS PROVEN TO HAVE A BERRY ANEURYSM.

Case	*Prodomata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
14. J.S., male, age 27, electrician. Left-handed. Subependimal left frontal hæmatoma bulging from the roof of the lateral ventricle and obstructing it.	None. (Mild subarachnoid hæmorrhage two years before.)	1949: The illness began with a headache which persisted throughout. It was severe on the second day and he could not stand. On the seventh day his right side became numb and paralyzed and for the next two weeks he was amnesic and incontinent. Vision deteriorated and he was blind in the right eye after the 49th day. On admission to the neurosurgical unit on the 65th day he had bilateral papilledema, right optic atrophy and a severe right hemiplegia nearly complete in the arm.	1. Ventriculogram, 69th day. 2. Left carotid arteriogram, 70th day. Craniotomy and evacuation of the hæmatoma, in which a berry aneurysm was discovered on microscopical examination, 78th day.	Twice, after ventriculography, he became comatose and breathing stopped, but on both occasions he responded dramatically to tapping the ventricles. The arteriogram was of good quality but failed to show the aneurysm. Convalescence was complicated by a C.S.F. leak and meningitis.	Visual acuity recovered fully from finger counting only, in the left eye, but he remained permanently blind in the right eye. After eight weeks he was still mentally slow and showed a mild hemiplegia. Recovery was complete except for vision after a year. During the next two years he had about 18 seizures, but they were less common in the fourth postoperative year. However, he had not returned to work and wished to enter an epileptic colony.
15. P.W., fem., age 52, housewife. Large right temporal hæmatoma.	None. (She suffered also from severe hypertension.)	1949: Onset with severe right frontal headache was followed by a left hemiplegia and coma within 24 hours. She improved over the next 5 days enough to speak, and then showed a left hemianopia, left hemianæsthesia and bilateral extensor plantar responses. She slipped into coma again over the subsequent 4 days.	1. Right carotid arteriogram, 9th day. 2. Craniotomy and evacuation of hæmatoma, but the aneurysm at the origin of the right posterior communicating artery was not excised, 9th day.	She steadily deteriorated following operation with a steep rise in temperature and respiratory rate on the 3rd postoperative day when she died. No autopsy.	*Postoperative Death*

GROUP II—(*Continued*)

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
16. H.E., male, age 28, engineer. Very large deep right fronto-temporo-parietal hæmatoma. Thin subdural hæmatoma.	Pain in calves and lumbar region, 4 months. Mild headache and malaise, 6 weeks.	1952: He developed severe headache and vomiting while at work, but he improved after two days in bed, when he had a major seizure. After a second major seizure six hours later a left hemiparesis and severe papillœdema was noted. Within 12 hours he was in coma.	1. Ventriculogram, 3rd day. 2. Aspiration of 40 c.c. of blood followed by brisk arterial bleeding, 3rd day. 3. Ventriculogram, 4th day. 4. Right carotid ligature, 4th day.	The arterial bleeding during operation was arrested by carotid compression. He deteriorated overnight and died on 5th day.	Autopsy showed evidence of fresh bleeding from a sessile berry aneurysm half an inch beyond the bifurcation of the right middle cerebral artery. *Postoperative Death*
17. E.McI., fem., age 25, clerk. Large left temporal hæmatoma. Thin subdural hæmatoma.	Severe frontal headache lasting 6 hours one month previously. Similar headache lasting 24 hours, ending about 10 hours before onset.	1952: She was found on the kitchen floor aphasic with a minimal right hemiparesis, and within 24 hours papillœdema, right hemianopia, rigid neck, Kernig's sign and bradycardia were noted. By the fourth day she was also drowsy and the hemiplegia was severe.	1. Left carotid arteriogram, 5th day (an aneurysm at the origin of the posterior communicating artery was seen). 2. Aspiration of 20 c.c. of blood, 6th day.	Two weeks later she was still severely aphasic, but the hemiparesis was minimal.	By five months the hemiplegia had fully recovered, but minimal dyslexia and dysgraphia remained when she married three years later.
18. T.J., male, age 35, aircraft control officer. Large right fronto-temporo-parietal hæmatoma. Thin dural hæmatoma.	None.	1953: Severe occipital headache and vomiting at mid-day was followed by a collapse at 8 p.m., leading to full coma with divergent squint and slow pulse at 10.00 p.m. At midnight he was disorientated and aggressive. Next morning he was more drowsy and had a severe left hemiplegia. He was again in coma on the 3rd and 10th day, being confused between whiles. Papillœdema and a right internal rectus palsy developed 5th day.	1. Right carotid arteriogram, 9th day. 2. Aspiration of 10 c.c. of blood, 10th day. 3. Craniotomy, evacuation of hæmatoma and excision of an aneurysm on the middle cerebral artery 1 inch from its origin, 15th day.	He was alert, but confused and disorientated with severe hemiplegia and complete hemianopia after three weeks.	After 4 months there was a full mental recovery but a minimal left hemiparesis and a left lower quadrantic visual field defect were present. Two years later he had no disability except a small visual field defect.

GROUP III—PATIENTS PROVEN TO HAVE AN ANGIOMA.

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
19. H.L., male, age 43, builder. Large left temporal hæmatoma. Thin subdural hæmatoma.	None. (Major seizures about once a year for 17 years.)	1950: He fell in "coma" while at work. On the 4th day he was still confused and showed nominal dysphasia and minimal right hemiparesis. On the 11th day he was alert, disorientated, mildly dysphasic and showed a weakness of the right foot. On the 24th day a right 6th nerve palsy and right hemianopia were first detected.	1. Left carotid arteriogram, 18th day. 2. Ventriculogram, 20th day. 3. Ventriculogram, 21st day. 4. Craniotomy and evacuation of hæmatoma, 28th day. 5. Left carotid arteriogram, 41st day showing no shift of anterior cerebral artery, but when repeated (6) 9 months later there was. 7. Craniotomy and excision of temporal angioma 3 x 2 x 1 cm. next day, 9 months after the onset.	Minimal dysphasia, hemiparesis and hemianopia two weeks after first craniotomy. Three months later he developed daily seizures, became mentally retarded and ataxic, possibly due to Dilantin toxicity. Uneventful convalescence after second operation.	After excisions of the angioma he managed to work for 8 months, when he again developed daily seizures. He has twice been admitted to a mental hospital in the last 3 years with severe depression.

GROUP III—(*Continued*)

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
20. E.P.B., fem., age 18, student. Left handed. Very large right temporo-parieto-occipital hæmatoma.	None.	1951: A sudden onset of right-sided headache, vomiting, drowsiness and slight dysphasia was followed by progressive blurring of vision, diplopia, ptosis, dysphasia and left hemiparesis over the next five days, when a complete left homonymous hemianopia and papillœdema were noted. The papillœdema progressed for 11 days but otherwise she steadily improved until dysphasia was slight and power in the limbs full by the 24th day.	1. Aspiration of 5 c.c. of blood and a cystogram, 17th day. 2. Right carotid arteriogram, 20th day. 3. Craniotomy, evacuation of hæmatoma and excision of angioma, about 1 cm. in diameter, in posterior parietal region, 25th day. 4. Right carotid arteriogram, 26th day.	Moderate dysphasia, mild sensory ataxia and left lower quadrantic visual field defect 18 days after operation.	Four months later she was in excellent health and without symptoms or signs except for the visual field defect. Eighteen months later she had a major seizure. She was enjoying a full life 4 years later.
21. R.S., male, age 12, schoolboy. Very large right temporo-parieto-occipital hæmatoma.	None.	1951: He missed his midday meal. That night he awoke complaining of nausea and vomited repeatedly. Next morning he felt sick and could not stand, and his head felt heavy. By the evening he was drowsy, confused and incontinent and had a left hemiparesis. On the third morning he had a severe headache for the first time and showed a complete hemiplegia, hemianæsthesia, hemianopia, stiff neck and Kernig's sign.	1. Aspiration of 5 c.c. of blood, cystogram and ventriculogram 3rd day. 2. Right carotid arteriogram, 8th day. 3. Craniotomy, evacuation of hæmatoma and excision of posterior parietal angioma, measuring about 5 x 5 x 2 cm., 9th day. 4. Right carotid arteriogram, 37th day.	He was alert with slight hemiparesis five days after aspiration, but papillœdema was now much worse. One month after craniotomy he was slow mentally and showed a severe sensory ataxia and left lower quadrantic hemianopia.	Five months later he was well, up to standard at school, but some sensory loss remained in the left hand, which he was reluctant to use. Three and a half years later he was still reluctant to use this hand, but was otherwise very well.
22. I.P., fem., age 33, housewife. Very large left fronto-parietal parasaggital encapsulated hæmatoma. Ventricular dilatation.	None. (She suffered from congenital heart disease and was 32 weeks pregnant at the onset of her illness.)	1951: She was admitted to hospital in "coma" with a right hemiplegia and a stiff neck. Five weeks later she was alert, hemiplegic and aphasic. After seven weeks she developed focal seizures of the right side of her face, vomiting, drowsiness, bradycardia, neck stiffness and Kernig's sign. Five days later the left pupil dilated and became fixed to light.	1. Normal delivery, 35th day. 2. Left carotid arteriogram, 50th day. 3. Ventriculogram, 60th day. 4. Craniotomy, evacuation of hæmatoma and excision of parietal angioma, 4 x 2 x 1 cm. in diameter, 60th day. 5. Left carotid arteriogram, 109th day.	Her recovery was complicated by a meningitis eventually controlled by the 10th day. A mild left hemiparesis developed in addition to the complete right hemiplegia and aphasia. She deteriorated over the next 8½ months and eventually died. The fatal outcome of this case is mysterious, but the ventriculograms suggest that she suffered also from communicating hydrocephalus.	
23. F.E., male, age 29, plumber. Large left temporo-parietal hæmatoma.	Severe left-sided headaches with ataxic gait, on waking every morning for 3 mos. Brief paralysis of right leg, evening before onset.	1952: He fell with a right-sided focal seizure while the morning headache was severe. Dysphasia became progressively worse over the next four days, when a minimal right hemiparesis was noted. He was alert and orientated throughout the illness.	1. Left carotid arteriogram, 7th day. 2. Craniotomy, evacuation of hæmatoma and excision of superficial parietal angioma 1 cm. in diameter, 7th day. 3. Left carotid arteriogram, 23rd day.	Uneventful.	Four and a half months later the dysphasia had not completely recovered, but he managed to write a faultless letter. Thirty months later he still showed some dysphasia and was very deaf.

GROUP III (*Continued*)

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
24. P.B., male, age 30, postman. Large encapsulated right fronto-parietal para-saggital hæmatoma.	None. (Coma for a day at age 18. Suffered from headaches ever since.)	1952: A sudden onset of severe frontal headache was followed in a few seconds by a complete left hemiplegia. The headache ceased in one hour and the hemiplegia recovered a little after three weeks. He was alert throughout and there was no mental impairment except for dyscalculia. His left pupil was larger than the right.	1. Right carotid arteriogram, 20th day. 2. Craniotomy, evacuation of hæmatoma and excision of angioma, 1 cm. in diameter, in the rolandic cortex on the medial surface of the hemisphere, 43rd day.	Uneventful slow recovery.	Four and a half months later he showed only a little weakness of the left ankle. Eighteen months later he was working full time and enjoyed excellent health except for this slight weakness.
25. E.T., male, age 36, motor mechanic. Very large encapsulated left frontal hæmatoma.	None. (4 major seizures a year for 6 years.)	1953: His illness began suddenly with "coma" and vomiting. Two hours later he was confused, aphasic and showed a complete right hemiplegia. After five days his speech improved sufficiently for him to complain of headache but the hemiplegia remained complete until operation. He developed pneumonia from which he recovered on the 12th day.	1. Left carotid arteriogram, 8th day. 2. Craniotomy, evacuation of hæmatoma and excision of frontal angioma 5 x 3 x 2 cm. in diameter, 17th day.	Second attack of pneumonia from 3rd to 7th postoperative day. Recovery slow.	Five months later he had a mild hemiparesis and dysphasia. Twenty months later there was no dysphasia and the hemiparesis was minimal. He was working full time. No further seizures.
26. S.C., fem., age 13, schoolgirl. Very large right fronto-parietal hæmatoma.	None.	1953: She awoke screaming. Her left limbs were paralyzed and she thought they were not her own. She vomited, became drowsy and in six hours had a severe right temporal and suboccipital headache.	1. Right carotid arteriogram, 3rd day. 2. Craniotomy, evacuation of hæmatoma and excision of parietal angioma 1 cm. in diameter, 3rd day.	Slow uneventful recovery.	In three months the hemianopia and hemianæsthesia had recovered but the hemiplegia remained severe. Sixteen months later only a mild hemiparesis most marked in the arm remained.
27. M.J., fem., age 21, typist. Large right fronto-parietal hæmatoma.	None.	1953: A sudden onset of severe right-sided headache and weakness of left arm was soon followed by coma, with rapid, periodic respiration and a pulse rate of 40. She was alert next day and on the 10th day she was orientated, but remained unaware of the complete hemiplegia. Papillœdema was noted.	1. Right carotid arteriogram, 2nd day. 2. Craniotomy, evacuation of hæmatoma and excision of parietal angioma, 1 cm. in diameter, 14th day.	In 5 weeks she made a complete mental recovery, but only a little movement had returned in the paralyzed limbs.	Ten months later the hemiparesis was still severe in the hand and a flexion deformity was developing in the fingers.

GROUP IV.—CASES IN WHICH NO CAUSE FOR THE BLEEDING WAS DEMONSTRATED.

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
28. D.O., fem., age 44, housewife. Large right, deep, fronto-temporal hæmatoma.	None. (Rare minor seizures between ages of 3 and 16. Previous similar illness with full recovery two years before.)	1942: Intense frontal headache was followed by the gradual development of a moderately severe left hemiparesis over about 10 days. She was then mentally slow and drowsy and showed ptosis, dilated left pupil and left hemianopia.	1. Ventriculogram, 14th day. 2. Aspiration of 20 cc. blood, 14th day.	There was no great improvement 10 days after aspiration, but she had completely recovered after 4 weeks.	She remained well until she died of an acute illness about 2 years later. No details are available.
29. M.B., fem., age 24. Large left frontal hæmatoma.	None. (About 12 major seizures a year for six years.)	1943: Seven major seizures in a day were followed by coma for 48 hours. Fourteen days later she was still mentally slow and showed an ataxic gait and papillœdema.	1. Ventriculogram, 14th day. 2. Craniotomy and evacuation of hæmatoma, 17th day.	She had a complete amnesia from the onset until waking from the anæsthetic. Recovery was complete by the 16th operative day.	Four major seizures in the first year, 9 major seizures in the next 2 years, 3 in the next 3 years and none in the subsequent 5 years. She has married and she has two children. She remains very well after 11 years.

GROUP IV—(*Continued*)

Case	*Prodromata*	*Onset and course*	*Operations*	*Postoperative course*	*Result*
30. J.P., fem., age 17, stenographer. Left-handed. Large encapsulated left temporo-parietal hæmatoma.	Dull left frontal headache worse in the morning 3 weeks before the onset, persisting during the first 5 weeks of the illness.	1947: She suddenly developed dysgraphia and dyslexia which cleared in two hours to leave a mild global dysphasia of which the patient was unaware. A 6th nerve palsy and vomiting soon followed. She improved a little after the sixth week when she showed intense chronic papillœdema and a minimal right hemiparesis. She remained alert and sensible throughout.	1. Ventriculogram, 49th day. 2. Aspiration of 5 c.c. of blood, 54th day. 3. Craniotomy and evacuation of hæmatoma, 55th day. 4. Negative left carotid arteriogram prior to marriage, 4 years later.	Minimal hemiparesis, hemianæsthesia and right inferior quadrantic hemianopia a month later.	Sixteen months later only a minimal dysarthria and the visual field defect remained. Six major and occasional minor seizures in the next 4 years. Since then she has led a full married life in spite of about 2 minor seizures a year.
31. J.W., male, age 40, draughtsman. Very large deep left temporo-parietal hæmatoma.	None.	1948: He was awakened by severe headache, but went to sleep again. Next morning he was found staggering in the bathroom, unable to communicate by speech or gesture. A severe right hemiparesis developed over the next five days. Speech improved slightly but after 10 days he was severely dysphasic and drowsy. Papillœdema and right homonymous hemianopia were noted. His condition deteriorated on the 11th night.	1. Cystogram, aspiration of 40 c.c. of blood and ventriculogram, 12th day (see Fig. 1). 2. Craniotomy and evacuation of hæmatoma, 12th day.	Hemianopia and severe dysphasia remained after one month.	After 4 months the dysphasia was very slight, the hemiplegia had recovered, and the right lower quadrantic visual field defect was not dense. He has worked and been promoted since. He leads a very full life, but after 5 years he still has a slight hesitancy over names and is aware of the persistent field defect.
32. H.S., male, age 40 labourer. Large left frontal hæmatoma bulging into the floor of the anterior horn of the lateral ventricle.	Daily severe frontal and sub-occipital headaches lasting from 10 to 20 minutes for 1 year. Unconscious for 15 minutes 18 days before onset. His headaches were worse and his behaviour bizarre following this episode.	1949: He fell unconscious again in the street, recovering in 20 minutes, but he remained confused and drowsy afterwards. Mild left hemiparesis, sparing the face, slurred speech and papillœdema were noted.	1. Ventricular drainage, 1st day. 2. Ventriculogram, 3rd day. 3. Craniotomy and evacuation of hæmatoma, 3rd day. (In a cavity 2 cm. in front of the foramen of Monro a purple object was seen, thought to be an aneurysm. It was packed off with "oxycel" gauze.) 4. Bilateral negative carotid arteriograms, 14th day.	Six weeks later he was alert, slow, monosyllabic, disorientated and incontinent.	Three years later he was an unkempt dement unable to keep a simple labouring job. He would do what he was told to do by his wife, but if not given instructions he would sit, grin inanely, and do nothing. He had occasional epileptic seizures.
33. B.L., male, age 37, commercial traveller. Large right parietal hæmatoma.	Spells of dizziness, faintness and sweating for 9 months. Sudden onset of severe headache lasting 24 hours, 8 days before onset, while carrying a heavy bag.	1949: He was awakened by sudden intense headache and vomiting. A few hours later he was drowsy and had a mild left hemiplegia, hemianopia and loss of position sense in the fingers. Two and a half days later the hemiplegia was complete.	1. Right carotid arteriogram, 3rd day. 2. Craniotomy and evacuation of hæmatoma, 4th day.	Improvement slow, but the mental recovery was full in one month.	A moderate hemiparesis and loss of position sense has persisted for 4 years. He is fully employed at his old job, in spite of rare major epileptic seizures. He can walk well.

Cases 10 and 15 were in coma before operation and it is therefore probable that the brain stem had already suffered irreversible damage.

Cases 2 and 12 were alert before aspiration of the hæmatoma and Cases 8 and 13 showed only moderate confusion. There was a dramatic advance in the tentorial pressure cone after operation in each case and they died in coma. In Cases 12 and 13 the pupils were fixed and dilated within 15 minutes, but the deterioration was a little slower in the other two patients. Repeated aspiration failed to show evidence of fresh bleeding or influence the course in Case 2, but no autopsy was obtained. In the other three patients the hæmatoma was evacuated at craniotomy as an emergency. The brain was found to be swollen and "tight", bulging through the dural opening, but no fresh blood mixed with old was found within the hæmatoma cavity in any case. Later the pressure was found to be exceptionally low in the ventricles and at lumbar puncture. Brain stem hæmorrhages secondary to the pressure cone were found at autopsy, but no other evidence of fresh bleeding. The sequence of events in these four patients is most easily ascribed to a transitory gross increase in the brain swelling round the hæmatoma cavity, either due to vascular engorgement or œdema. This complication was recognized in four of the nine hypertensive patients treated by aspiration, but in none of the eight non-hypertensive patients treated in this manner nor in any patient treated first by evacuation of the hæmatoma. This evidence suggests that aspiration of the hæmatoma through a burr hole is a more hazardous procedure than craniotomy in a hypertensive patient. A similar deterioration has been observed after a biopsy has been taken from a glioma, through a burr hole.

THE FOLLOW-UP

The fate of the 26 patients discharged from hospital is shown in Table II.

TABLE II.

Total number surviving operation	26
Leading normal lives, with or without mild disabilities	14
Severely disabled	7
Died between 6 and 24 months after operation	4
Failed to return to follow-up clinic and presumed dead	1

THOSE LEADING NORMAL LIVES

The first two groups in Table II have been followed up for periods varying between one and 11 years, with an average of approximately three years. The excellence of some of the recoveries in the first group of 14 patients leading normal lives requires emphasis. Case 29 is that of a girl who has married and had two children since a large left frontal hæmatoma was evacuated. She had occasional seizures for a few years, but during the last five years has been without any disability at all. Case 31 is that of a man with a very large hæmatoma in the left temporoparietal region, who had made no significant recovery from complete aphasia before operation. He returned to his highly skilled work four months after operation and has been promoted since. Five years later he showed a slight quadrantic visual field defect and was still aware of a little hesitancy over names when he was tired, though he showed no objective evidence of dysphasia. The x-ray photographs (Fig. 1) show the vast size of the hæmatoma cavity in this patient, after some of the blood had been aspirated and replaced with air. At the craniotomy, blood clot was found to line the cavity wall and prevent it from collapsing. It is probable that this patient would have made a very poor recovery without the second operation because it is doubtful whether aspiration reduced the size of the hæmatoma.

The excellent recovery in speech in this man can only mean that little brain tissue had been destroyed, though a great deal had been rendered temporarily functionless by compression.

Case 9 is that of a hypertensive patient with a very large hæmatoma probably involving the basal ganglia. After repeated aspiration, he made an excellent recovery from complete hemiplegia with anosognosia. It is probable that mural clot did not keep the cavity open, as decreasing quantities of blood were obtained at each aspiration. In Case 4, the patient made no significant recovery after repeated aspiration, though more blood was removed than in Case 9. A larger quantity was obtained from the second aspiration, suggesting that the cavity had failed to collapse.

Cases 26 and 27 are of two girls with hæmatomata in similar locations who both suffered from complete hemiplegia. The hemiplegia was still severe in the first patient after three months, but after 16 months was mild and confined to the arm. The second patient, whose hæmatoma was evacuated after a longer delay, has made

no significant recovery. Hemiplegia after a cerebral hæmorrhage may continue to recover for a much longer time than a similar disability caused by cerebral infarction. Case 33 is that of the most disabled patient in this group. He continues to carry a heavy suitcase of samples, walking from house to house through the streets of London, in spite of a moderate left hemiplegia and rare epileptic seizures.

The excellent recovery in these patients has led to the opinion that massive cerebral hæmorrhage causes only trivial brain destruction initially and that ischæmic necrosis progresses in the cavity wall so long as the pressure in the hæmatoma remains high. This process may be arrested by evacuation or adequate aspiration of the hæmatoma. Clinical evidence for this view has been published,[14] and pathological confirmation has been obtained by the present author and will be reported. In some fulminating cases of cerebral hæmorrhage ischæmic necrosis may progress so fast that the internal capsule, which is never torn initially, may be destroyed within a few hours.

THE SEVERELY DISABLED

Of the seven patients who have been unable to resume a normal life only three show definite evidence of gross cerebral destruction. Case 23 is that of a patient who is disabled by deafness, in no way related to the cerebral hæmorrhage. One patient (Case 19) has frequent major seizures and recurrent attacks of psychotic depression and another (Case 3) developed a paranoid psychosis during his convalescence. It is not clear why the remaining patient (Case 14) is disabled. He suffers from occasional seizures which should not prevent his finding employment; he appears to lack initiative and this may be due to frontal lobe damage.

THE DELAYED MORTALITY

Four of the 26 who survived operation have died during the period of follow-up, and a fifth patient, with whom contact has been lost, may be dead. Two of these patients had made complete recoveries and were leading full lives up to the time of death. Two hypertensive patients died of second massive hæmorrhages into the opposite hemisphere. It is important to note that the other five survivors with hypertension have not developed this complication during the period of follow-up, which has varied from one to five years and averaged three years. It is a common argument against surgical intervention in hypertensive cerebral hæmorrhage that if one artery was so diseased that it ruptured, others must be similarly affected and a subsequent hæmorrhage can be anticipated if the patient survives the first. This pessimistic view is not supported by this experience, but much more evidence is required before this risk can be fairly assessed.

EPILEPTIC SEIZURES

Four patients (Cases 19, 25, 28 and 29) suffered from seizures before the onset of cerebral hæmorrhage. The first two patients were shown to have angiomata, and this diagnosis was probable in the last two who were not investigated by angiography. The illness was complicated by seizures in three patients (Cases 1, 16 and 29), and nine of the 26 patients surviving operation (Cases 5, 6, 14, 19, 20, 29, 30, 32 and 33) later suffered from solitary or recurring seizures, an incidence of 35%. The scar of a cerebral hæmorrhage proves to be much more epileptogenic than that of a cerebral infarct, though these too may occasionally give rise to seizures. Only three of the patients suffering from vascular anomalies developed seizures after their illnesses. Two patients who suffered from seizures before the cerebral hæmorrhage were free of attacks afterwards, and a third patient had fewer attacks each year and has been free of seizures for five years. Only two patients have been unable to return to their former occupation because of epilepsy. Surgical excision of the cortical part of the scar in these patients might be considered.

DISCUSSION

Of the 19 patients with ruptured vascular anomalies, or without a demonstrated cause for their cerebral hæmorrhage, who did not suffer from arterial hypertension, 12 were able to return to their former occupation and 11 remain in good health. The surgical mortality was 5%. Comparable results have been reported by others in similar patients. Though no control series is available, it is difficult to believe that such results could have been obtained by conservative treatment and it is therefore argued that all similar patients should be submitted to surgery with-

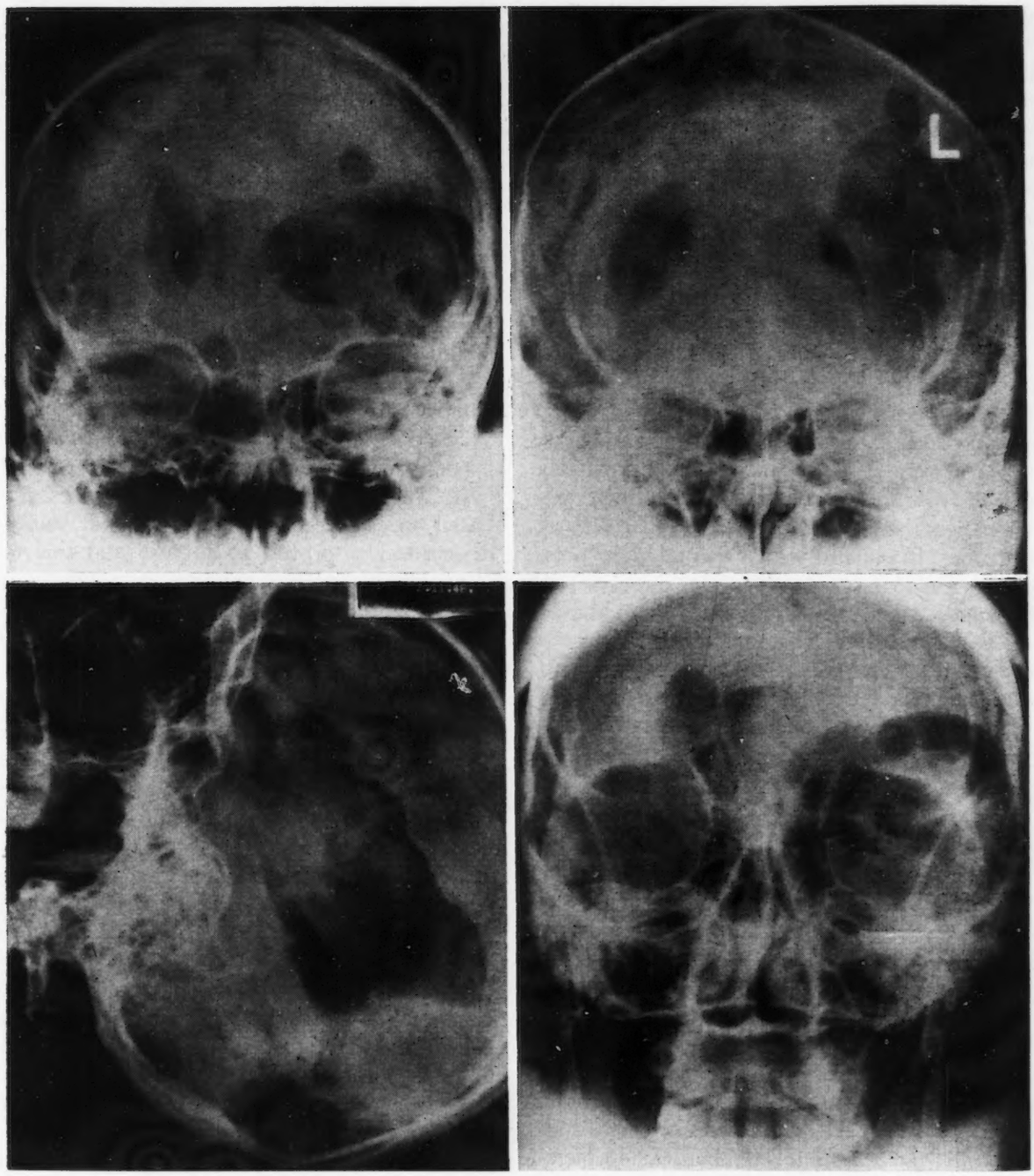


Fig. 1.—Combined ventriculogram and cystogram of Case 31.

out delay. They should be investigated by angiography, so that the vascular anomaly may be demonstrated and removed where possible. If there is no shift of the cerebral vessels it is unlikely that the hæmatoma is massive or requires removal. Aspiration carries a slight risk of provoking further hæmorrhage, but it may be justified to employ this method in an emergency. Evacuation of the hæmatoma at craniotomy is safer and more certain to be effective.

It is not possible to come to such a dogmatic conclusion about the management of patients with arterial hypertension. Of the 14 patients with hypertension only four were able to return to work and one of these died shortly afterwards. In three of these four patients it is doubtful whether surgical intervention substantially altered the course of the disease. The surgical mortality was 43%. Two of the seven survivors later died of a second massive cerebral hæmorr-

hage. Beck[8] (1953) reported better results than these in a small group of hypertensive patients, and it is believed that it should be possible to improve on these figures. There is no fundamental difference in the pathology of cerebral hæmorrhage in hypertensive and non-hypertensive patients, but the higher pressure in the hæmatoma leads to more rapid progression of the ischæmic necrosis in the cavity wall. Though there is no great difference in the size of the hæmatoma, a fatal tentorial pressure cone develops earlier. There is always considerable swelling of the brain around the hæmatoma during the first few days of the illness and it is suspected that this may be greater in the hypertensive patients. Evidence has been presented which suggests that aspiration of the hæmatoma may provoke a fatal increase in this swelling in some hypertensive patients and that it is therefore particularly dangerous. In patients with a normal blood pressure, no such complication has been encountered. It is suggested that hypertensive patients should also be investigated by angiography because a surprisingly high proportion have berry aneurysms, and that they should be treated by early evacuation of the hæmatoma at craniotomy.

The residual disabilities would be very much less severe if every patient was treated on the first day of his illness. No patient was treated before the third day in this series and the average interval between onset and operation was 19 days. It is commonly argued that it is wise to wait a few days before operating, in order to allow bleeding to stop. However, persistent hæmorrhage has only proved difficult to control once in this series, and in patients without vascular anomalies it should not be a great risk if all bleeding points are arrested in the cavity after the hæmatoma has been evacuated. It is brain swelling which makes craniotomy so hazardous in the first few days after a subarachnoid hæmorrhage and it also makes early operation difficult in cerebral hæmorrhage. The author has published his limited experience in treating nine moribund patients with intracranial hæmorrhage with prolonged hypothermia,[14] and though only two patients survived it was shown conclusively that this method of treatment will control the swelling adequately in the majority of cases. The many complications which were encountered were attributable to the moribund state of the patients, and it is believed that prolonged hypothermia will allow safe surgical intervention during the first day of the illness in all patients with cerebral hæmorrhage who are not actually moribund. It is hoped that this technique will produce much better results in cases both with and without hypertension.

While it is argued that the diagnosis of massive cerebral hæmorrhage in a previously healthy patient without hypertension or evidence of diseases such as leukæmia or glioblastoma should always be followed by surgical investigation and treatment, it is admitted that if hypertension is present the selection of patients for operation is difficult. However, operation should always be considered. Essential hypertension is often compatible with many years of unrestricted life.

The diagnosis of massive cerebral hæmorrhage is occasionally difficult or impossible, but is often easy. The classical accounts of this disease are based on case records of patients in whom the diagnosis was proved at autopsy and this material gives a unique opportunity to study the clinical features of milder forms of the disease. This study will be the subject of a later communication.

SUMMARY

1. The case histories of 33 patients with spontaneous massive cerebral hæmorrhage treated by evacuation or aspiration of the hæmatoma have been presented.

2. The surgical mortality was 21% for the whole group, 5% for the non-hypertensive group of 19 patients and 43% in the hypertensive group of 14 patients.

3. Fourteen of the survivors remained well during the follow-up and their lives have not been seriously restricted. Seven others were unable to return to work.

4. Epilepsy developed as a delayed complication in 35% of the survivors.

5. Evidence has been presented which suggests that aspiration is more dangerous than craniotomy and evacuation of the hæmatoma, especially in hypertensive patients, and it is suspected that it is sometimes less effective.

6. It is concluded that all patients with massive cerebral hæmorrhage without hypertension should be treated surgically, as well as selected cases with arterial hypertension.

7. Early operation is advocated.

I wish to thank Mr. Wylie McKissock for his encouragement and assistance in preparing this paper, for permission to report the 30 patients under his care and for his assistance in obtaining the follow-up.

I also wish to thank Mr. Harvey Jackson and Mr. Valentine Logue for permission to report cases under their care, and Dr. Purdom Martin and Dr. F. L. McNaughton for their detailed criticism and advice. The material for this report was collected while I was holding the post of Academic Registrar at the National Hospital, Queen Square. I am grateful for permission from the medical boards of the National Hospital and St. George's Hospital to publish this report.

REFERENCES

1. HEUSNER, L.: *Deutsche med. Wchnschr.*, 14: 851, 1888.
2. CUSHING, H.: *Am. J. M. Sc.*, 125: 1017, 1903.
3. RUSSELL, A. E. AND SARGENT, P.: *Proc. Roy. Soc. Med.*, 2: 44, 1908-9.
4. KRON, I. AND MINTZ, W.: *Deutsche med. Wchnschr.*, 53: 1054, 1927.
5. BAGLEY, C., JR.: *Arch. Neurol. & Psychiat.*, 27: 1133, 1932.
6. PENFIELD, W.: *Canad. M. A. J.*, 28: 369, 1933.
7. FEREY, M. D.: *Rev. neurol.*, 83: 368, 1950.
8. BECK, D.: *Arch. Middlesex Hosp.*, 3: 150, 1953.
9. WERNER, A.: *J. Neurol. Neurosurg. Psychiat.*, 17: 57, 1954.
10. PERRIA, L.: *Sistema nerv.*, 4: 322, 1952.
11. ARING, C. D. AND MERRITT, H. H.: *Arch. Int. Med.*, 56: 435, 1935.
12. ROSE, W. M.: *Lancet*, 2: 561, 1948.
13. Great Britain Medical Research Council: Glossary of Psychological Terms Commonly Used in Cases of Head Injury, War Memorandum No. 4, His Majesty's Stationery Office, London, 1941.
14. HOWELL, D. A., STRATFORD, J. G. AND POSNIKOFF, J.: *Canad. M. A. J.*, 75: 388, 1956.

RÉSUMÉ

Les faits cliniques de 33 malades atteints d'hémorragie cérébrale massive spontanée, et traités par l'évacuation ou l'aspiration de l'hématome, sont présentés. La mortalité chirurgicale s'éleva à 21% pour le groupe en entier, à savoir 5% de ceux dont la tension artérielle était normale et 43% du groupe des hypertendus. Quatorze des malades qui survécurent se portèrent bien pendant la période d'observation prolongée à laquelle ils furent soumis, et leurs habitudes de vie n'eurent pas à être sérieusement modifiées. Sept autres furent incapables de retourner à l'ouvrage. L'épilepsie apparut comme complication retardée chez 35% des survivants. Certaines preuves sont offertes permettant de penser que l'aspiration est plus dangereuse que la craniotomie et l'évacuation de l'hématome, particulièrement chez les hypertendus; on croit aussi que cette méthode n'est pas toujours la plus efficace. L'auteur conclut en suggérant que tous les malades atteints d'hémorragie cérébrale massive soient opérés si leur tension artérielle est normale, et que l'on doit aussi intervenir chez certains hypertendus judicieusement choisis. L'opération ne doit pas être différée.

HOW IMPORTANT ARE PSYCHOSOMATIC FACTORS IN THE FIELD OF DERMATOLOGY?

STUART MADDIN, M.D., *Vancouver, B.C.*

DERMATOLOGY HAS BEEN one of the branches of medicine most influenced by the psychosomatic concept. Recent standard dermatological textbooks, our journals, comments by our patients, and the clinical practice of the specialty all in greater or lesser degree reflect this influence.

I propose to examine the contributions that psychosomatic medicine has made and the controversies to which it has given rise. Advocates of the psychosomatic school imply that disease processes may be the result of nervous or emotional stresses. Obermayer[1] in his recent textbook, "Psychocutaneous Medicine", states that more than 30 cutaneous diseases, including infections, involve the psyche to greater or lesser degree. Not only do the adherents of this concept advance several etiological theories to explain dermatological disease but they also offer several therapeutic approaches. In a specialty such as dermatology, challenged as it is by numerous cutaneous diseases of unknown etiology, such a theory is readily acceptable. This, coupled with the addition of yet another therapeutic tool called psychotherapy, makes the concept doubly attractive.

By definition the term psychosomatic medicine emphasizes the interdependence of mental processes and bodily function. Therefore in the diagnosis and management of disease both the mental and physical components must be related. Such a concept enjoys complete medical acceptance, and has long been championed by members of our profession.

The term psychosomatic has no generally accepted definition, according to Macalpine.[2] Usually, however, the term is reserved for those cases in which the psyche plays the major role in producing symptoms. How the emotions produce these symptoms is not known.[3] Most authorities agree that the hypothalamus through its connection with the cerebral cortex influences man's emotional responses. What causes psychosomatic disease? Here again the answer is not known, but one school of psychiatric opinion holds that emotional immaturity can be responsible, another that anxiety or maternal rejection is the key; other equally respected authorities blame environment; still others conclude that constitutional factors are causative. It is therefore imperative that we physicians realize that we are dealing with a concept that defies a

precise definition, that operates through an unknown mechanism to produce its supposed untoward results. Nor should we forget that the authorities best equipped by their experience and training are not at all unanimous in their choice of any of the aforementioned theories.[4]

Before going further there are several features of psychosomatic medicine that should be stressed. First, its terminology is so confusing and obscure that even the notorious complications of dermatology seem lucid by comparison. In fact, the *American Journal of Psychiatry* recently published an editorial entitled "Gobbledygook in Psychiatric Writing".[5] Secondly, an increasing number of articles are appearing in psychiatric literature which criticize the lack of adequate theory and the substitution of a highly technical jargon in place of a solid basis of fact.[6-8]

WHY HAVE PSYCHOSOMATIC FACTORS SO INFLUENCED THE FIELD OF DERMATOLOGY?

There are numerous reasons why psychosomatic factors have come to take such a dominant role in the field of cutaneous medicine. Several of these factors are quite obvious, while others are more obscure.

One obvious reason is the ease with which the entire skin surface lends itself to observation. This is coupled with the observable physiological occurrences which the cutaneous surface undergoes, such as blushing, blanching, and sweating, which develop in response to environmental changes, either physical or emotional. On the basis of these observable and physiologically valid occurrences some investigators have attempted to erect a hypothetical structure which suggests that a set of emotional circumstances are responsible for, or play a major part in, the production of dermatological lesions which we recognize as atopic dermatitis, acne rosacea, pruritus ani, pruritus vulvæ, seborrhœic dermatitis and psoriasis.

In the past, much significance has been attached to the common embryologic origin of both skin and central nervous system. Wittkower and Russell[9] state that it is not yet possible to explain psychosomatic manifestations in the skin, in terms of neuroanatomy and physiology.

One further reason why the psychosomatic concept has come to play such an important role in the diagnosis and treatment of skin disease lies in the fact that the majority of medical schools devote too little time to the teaching of dermatology. Most physicians freely admit their inadequacies, both therapeutically and diagnostically, in this field. It is little wonder then that the recent medical graduate, faced as he is by a dermatological problem in ten to twelve out of every hundred patients, looks for a psychosomatic solution.

In managing a problem in this manner there is never any need for the physician to confess to the patient that he does not know the actual etiology of the disease, nor does he have to admit to the patient that he knows of no specific treatment. In many cases the dermatologically trained physician is faced with the same problem in the day-to-day management of rebellious and recurrent dermatological problems. However, if the dermatologist gives way to a psychosomatic diagnosis without first having elicited an adequate history and performed the appropriate diagnostic tests he is doing a grave injustice to both the patient and his profession; diagnosis by default achieves nothing.

Another important feature which deserves our attention is the large number of investigative reports dealing with psychocutaneous medicine which find their way into the press, popular magazines and even medical literature. Under such bombardment both the public and the busy but unwary physician are led to believe that the psychosomatic approach to medicine is the answer to many diagnostic and therapeutic problems that were formerly unanswerable.

WHAT HAS PSYCHOSOMATIC MEDICINE CONTRIBUTED TO DERMATOLOGY?

This branch of psychiatry has successfully restated and re-emphasized an age-old medical principle. It is therefore important that the physician who is called upon to treat diseases of the skin make certain that the patient be given ample opportunity to ask pertinent questions. The possibility of a lesion being premalignant or malignant, whether or not the condition will result in scar formation or lead to permanent disfigurement, the possibility of infecting other members of the family or of the disease being a manifestation of venereal disease are all important questions in the mind of the patient. Frequently the patient is more anxious to have answers to these questions than to be told the diagnosis. In fact, it is quite impossible for any physician to practise the

complete art of medicine without taking into consideration the patient as a person and not just a dermatological problem.

Proponents of the psychosomatic discipline have advanced several possible mechanisms to explain cutaneous diseases of hitherto unknown etiology. Sydenham in 1681 suggested hysteria as the cause of angioneurotic œdema.[11] Another English physician and dermatologist, Bateman, observed that pompholyx occurred with fatigue and anxiety. Some of our contemporary writers on the subject give credit to Brocq and Jacquet as being the pioneers in the field of psychocutaneous medicine, but in reality they were 210 years late.

More recently, investigators have advanced numerous etiological factors as being responsible for or contributing to cutaneous disease; sexual maladjustment, neurocirculatory instability, masochistic-sadistic trends, constitutional defect or gene-determined anomalies, environment and maternal rejection. This short list by no means exhausts the number of etiological factors that have found their way into the literature. The foregoing list should, however, acquaint one with the extreme breadth and diversity of opinion that surrounds this whole issue.

To enter into a detailed discussion of therapy suggested by the several different psychosomatic advocates would be quite impossible. In general, the therapeutic suggestions range from the taking of a careful history to many months or years of psychoanalysis. Sedation, usually by barbiturates and now by tranquilizers, is most frequently emphasized. The use of injections, for example of calcium gluconate or the patient's blood, is frequently stressed. Others have used relaxing exercises with success. Several workers have reported encouraging results through the use of group psychotherapy. Williams[12] stresses the importance of the maternal rejection factor in the management of children with atopic dermatitis. One other method which has been advocated is the use of "abreactive techniques", i.e. encouraging the patient to relive a traumatic incident with emotional intensity.

"Supportive" psychotherapy is the type most commonly employed, i.e. reassurance, advice and re-education, together with sedation, e.g. by phenobarbital. In summary, the therapy suggested for patients with psychocutaneous diseases differs from patient to patient as well as from dermatologist to dermatologist. Moreover, the techniques used by the dermatologist or psychiatrist differ not only because of the cutaneous disease variants present but also because of the real academic differences that each maintains in this regard.

CRITICAL ANALYSIS OF PSYCHOSOMATIC CONTRIBUTIONS TO DERMATOLOGY

Numerous references in our medical literature suggest that many of the conclusions drawn in regard to the psychosomatic aspects of dermatology are without adequate controls and biostatistical validations.[13, 14] The need for a critical review of this subject has recently been dealt with in an editorial appearing in the *British Medical Journal*[15] which contained this comment: ". . . nor is there any convincing evidence that emotional stress initiates a disease process, although it undoubtedly aggravates an existing one."

Sulzberger and Baer,[16] commenting on this subject state: "Unfortunately, it is not only in practice and as applied to individual cases but also in 'scientific' investigations and in publications and textbooks that one encounters what appears to be a manifest lack of judgement in regard to the proof of connections between psychic influences and cutaneous phenomena. Most attempts to ascribe various skin diseases to psychic and emotional factors have, we believe, fallen far short of satisfying those essential criteria of proof whose fulfilment every trained bacteriologist, physiologist, pathologist, biologist or other scientist would demand before accepting any other category of causal mechanism as having been proved."

Although some authorities have stated that it is unfair to challenge the psychosomatic concept with the demand for an accounting of therapeutic results, nevertheless an accounting of results is essential if we are to evaluate their contributions. Most workers in this field give very measured and not too optimistic figures when dealing with therapeutic results. Psychiatrists dealing with this subject have recently reported that 60% of the patients are substantially improved. In fact, such a figure falls within the statistical realm of the natural spontaneous rate of remission.[17] Ziskind[18] in dealing with this subject is of the opinion that patients are given support through a poorly understood psychotherapeutic technique, and over a period of time a more normal behaviour

pattern evolves which slowly returns them to an improved state.

Before closing this section it might be well to include a forthright admission made by two eminent psychiatrists[19] on the subject of contributions or real advances made by psychiatry: "Thus psychiatrists have spoken glibly of 'discoveries' and 'new insights' in the course of psychodynamic investigations and subsequent formulations. Truth to tell, these 'discoveries' if accurate at all have in most cases been restatements in modern idiom of truths about the human mind which have been known to the wise men throughout the ages, including, of course, many psychiatrists in our own age."

SUMMARY

As a starting point for an assessment of the contribution that psychosomatic medicine can make to dermatology, the following propositions[20, 21] would command general acceptance.

1. It would be ludicrous to deny the importance of psychosomatic factors in dermatology. It would be equally ludicrous on present evidence to suggest that they are of prime importance.

2. Organic disease is often clearly responsible for anxiety, and certain diseases which are often said to be "psychosomatic", such as widespread dermatitis, rheumatoid arthritis, and ulcerative colitis, are so distressing that the minds of their victims are particularly apt to be disturbed. The incautious observer may deduce that an emotional upset has caused some organic disease, when in fact the reverse is the case.

3. Psychological disorders are extremely common. Such disorders and a subsequent organic disease may in fact be coincidental, but the error may be made of relating them.

4. A proportion of people welcome the partial invalidism made possible by some innocent chronic disease, because it enables them to escape from their responsibilities or because it gives them the sympathy which they crave. The correct observation that a patient has this attitude may be followed by the deduction, which can easily be wrong, that it was actually responsible for his illness.

5. In many circumstances emotional factors provide an explanation of a disease so welcome to the patient or his relatives that the doctor may be tempted to give this explanation, or agree with it if it is suggested.

6. It should be the last factor considered, not the first; it should not be adduced simply through lack of a somatic explanation, that is, by exclusion.

7. It should not be employed in desperation, as an unconscious means of shifting the blame from our own inadequacy to the patient's temperament. The last, a failing common to us all, may be good psychotherapy—but only for the doctor.

8. Among the commoner fallacies is the tendency to ascribe skin disease to emotional causes without satisfying the essential criteria of proof demanded of every scientist.

9. Disregarding the natural course and fluctuations of many skin diseases, and accepting a cure by psychotherapy as proof of psychogenic causation, are two common causes of error.

10. The attempt to link certain skin diseases with certain types of personality, such as obsessional and hysterical, has so far contributed very little to the field of psychocutaneous medicine.

11. Failure to prescribe conventional and time-proven topical and systemic medications for a dermatological problem and substituting one form or another of psychotherapy because of its current popularity is to be deplored. Failure to alleviate cutaneous discomfort is in itself capable of producing psychic trauma.

REFERENCES

1. OBERMAYER, M. E.: Psychocutaneous medicine, Charles C Thomas, Springfield, Ill., 1955.
2. MACKENNA, R. M. B., Ed.: Modern trends in dermatology (second series), Butterworth & Co., Ltd., London, 1954, p. 23.
3. WITTKOWER, E. AND RUSSELL, B.: Emotional factors in skin disease, Cassell & Co., Ltd., London, 1953, p. 35.
4. MACKENNA, R. M. B., Ed.: Op. cit., p. 20.
5. Editorial: *Am. J. Psychiat.*, **108**: 474, 1951.
6. SHAKOW, D.: *Am. J. Orthopsychiat.*, **19**: 471, 1949.
7. EMANUEL, E.: *Canad. M. A. J.*, **74**: 259, 1956.
8. BOWMAN, K. M. AND ROSE, M.: *Am. J. Psychiat.*, **111**: 401, 1954.
9. WITTKOWER, E. AND RUSSELL, B.: Op. Cit., p. 28.
10. SULZBERGER, M. B. AND BAER, R. L., Ed.: Year book of dermatology and syphilology, Year Book Publishers, Inc., Chicago, 1952, p. 7.
11. OBERMAYER, M. E.: Op. cit., p. 4.
12. WILLIAMS, D. H.: *A.M.A. Arch. Dermat. & Syph.*, **63**: 545, 1951.
13. MACKENNA, R. M. B., Ed., Modern trends in dermatology (first series), Butterworth & Co., Ltd., London, 1948, p. 13.
14. WITTKOWER, E. AND RUSSELL, B.: Op. cit., p. 7.
15. Editorial: *Brit. M. J.*, **2**: 1136, 1951.
16. SULZBERGER, M. B. AND BAER, R. L., Ed.: Op. cit., p. 32.
17. DENKER, P. G.: *New York J. Med.*, **46**: 2164, 1946.
18. ZISKIND, E.: *Am. J. Psychiat.*, **106**: 285, 1949.
19. BOWMAN, K. M. AND ROSE, M.: *Am. J. Psychiat.*, **111**: 404, 1954.
20. O'NEILL, D.: Modern trends in psychosomatic medicine, Butterworth & Co. Ltd., London, 1955, p. 30.
21. LOEWENTHAL, L. J. A., Ed.: The eczemas, E. & S Livingstone, Ltd., Edinburgh, 1954, p. 159.

745 West Broadway.

RÉSUMÉ

L'auteur soutient que les facteurs psychosomatiques sont d'importance secondaire en dermatologie. Les inconvénients qui accompagnent certaines dermatites peuvent eux-mêmes devenir une source d'angoisse pour le malade, et la fréquence des affections psychologiques peut souvent expliquer leur co-existence avec d'autres maladies par pure coïncidence sans qu'il y ait relation de cause à effet. Certains malades s'accommodent très bien d'une infirmité partielle pour laquelle ils reçoivent des marques de sympathie qu'ils n'obtiendraient pas autrement. On ne doit pas considérer les causes émotives comme facteur étiologique des maladies de peau simplement par exclusion et sans raison évidente; elles ne doivent pas servir non plus comme solution facile à un échec thérapeutique. L'histoire naturelle des affections dermatologiques comprend de si nombreuses fluctuations que l'évaluation de leurs thérapeutiques est très difficile, y compris la psychothérapie.

EVALUATION OF DIRECT SURGICAL RELIEF OF THE PULMONARY OBSTRUCTION IN FALLOT'S MALFORMATION*

LEO R. LA FLECHE, M.D.,
G. GILBERT, M.D. and
E. D. GAGNON, M.D., F.R.C.S., *Montreal*

THE PRESENT REPORT includes 26 cases of Fallot's malformation treated by direct surgical attack by the Brock-Glover method at the Montreal Institute of Cardiology. These congenital cardiac anomalies are of the cyanotic group; they consist of several associated defects and may be classified in three types (Table I).

TABLE I.—PREOPERATIVE FINDINGS—CLINICAL

	No. Cases	*Cyanosis*	*Clubbing*	*Dyspnoea*	*Disability*	*Retarded development*	*Squatting*	*Loss of consciousness*	*Cardiac insufficiency*
TETRALOGY =									
Pulmonary stenosis (P.S.)	17	10+	13+	11+	9+				
Ventricular septal defect (V.S.D.)						11	16	10	0
Dext. aorta	65.4%	7++	4++	6++	8++				
PENTALOGY =									
Tetralogy	7	4+	5+	5+	5+				
Auricular septal defect (A.S.D.)	26.9%	3++	2++	2++	2++	5	3	3	0
TRILOGY =	2	1+	1+	1+	1+				
P.S.						1	0	0	1
A.S.D.	7.7%	1++	1++	1++	1++				

+ = slight or moderate; ++ = marked

The classical syndrome, originally described by Fallot in 1888, is a tetralogy, and consists of pulmonary stenosis associated with an interventricular septal defect and dextraposition of the aorta. The right ventricular hypertrophy, which constitutes the fourth feature in the tetrad, results from the other malformations. This cardiac anomaly is the most frequent of the cyanotic group. Seventeen patients ranging from three years to 29 years of age comprise this group.

The shunting of venous blood into the systemic circulation with resulting anoxæmia produces a characteristic symptom-complex. Cyanosis is the outstanding feature and its intensity varies from case to case. In 10 patients it was slight or moderate in intensity, but it was marked in the other seven cases. "Clubbing" was slight in 13 cases and advanced in four cases.

Subjectively, the presenting symptoms include exertional dyspnœa and a diminished exercise tolerance which in some cases is sufficiently marked to render the patient totally incapacitated. In eight out of 17 cases the physical disability was very marked. In 16 of the 17 patients characteristic "squatting" was a feature. Ten patients gave a history of episodes of anoxæmia with loss of consciousness, the latter being the most severe complication of the tetralogy and one which can very well be fatal.

The pentalogy is a tetralogy with the addition of an interauricular septal defect. Our series

*From the Institute of Cardiology, Montreal, Que.

includes seven cases of pentalogy, the patients ranging in age from 20 months to 16 years. These patients presented the same symptoms as in the tetralogy. However, it is noteworthy that in the majority of our cases the symptoms were somewhat less severe, a fact which the authors believe to be explicable by the added interauricular defect. While eight of the 17 cases of tetralogy were considered severely afflicted, only two out of seven cases of pentalogy were so considered.

The trilogy consists of pulmonary stenosis associated with an interauricular septal defect. The right ventricular hypertrophy is secondary and constitutes the third feature of the triad. Two cases of trilogy were operated on; one patient was a baby girl of 20 months, the other a girl eight years of age. These children presented with cyanosis, dyspnœa, physical disability and retarded development. Dyspnœa is the most important symptom in cases of trilogy; "squatting", on the other hand, is usually absent. Whereas episodes of anoxæmia are the main threat to life in cases of tetralogy and pentalogy, cardiac failure is the most dangerous complication of the trilogy.

In addition to the clinical signs and symptoms, the electrocardiogram and x-ray and laboratory findings are important aids in establishing the diagnosis and in evaluating these three types of Fallot's malformation.

The electrocardiogram consistently indicates a right axis deviation and right ventricular hypertrophy. The right axis deviation exceeded 150° in eight cases of tetralogy, two cases of pentalogy and one case of trilogy. Right ventricular hypertrophy was marked in 11 cases of tetralogy, two cases of pentalogy and one case of trilogy. It is noteworthy that the right ventricular hypertrophy was less marked in the majority of cases of pentalogy.

Radiologically, the heart was small or normal in size in 15 out of 17 cases of tetralogy. It was somewhat enlarged in six out of seven cases of pentalogy. Thus we can see that the heart size was somewhat enlarged in the majority of cases of pentalogy, while being usually of normal size in cases of tetralogy. In our two cases of trilogy, the heart was considerably enlarged.

Polycythæmia is a variable feature of Fallot's malformation. The hæmoglobin level was above 23 grams per 100 ml. in three cases of tetralogy and in one case of pentalogy. The hæmatocrit was above 60 in 11 cases of tetralogy and in one case of pentalogy.

In brief, tetralogy is characterized by cyanosis, "clubbing", physical disability, retarded development and "squatting". Episodes of anoxæmia with loss of consciousness are frequent and dangerous complications. The electrocardiogram shows right axis deviation and right ventricular hypertrophy. Cyanosis is the outstanding feature and polycythæmia is present. In cases of pentalogy, the same findings are present, but the authors have observed that in the majority of cases they are less marked. The trilogy presents with cyanosis, dyspnœa and retarded development. In these cases, dyspnœa is the outstanding feature and the most important complication is cardiac failure.

Prior to the surgical procedure, cardiac catheterization and angiocardiography are carried out to confirm the diagnosis and evaluate hæmodynamically the precise nature of the malformation. Of 26 cases operated on, 24 underwent cardiac catheterization and 25 had angiocardiography carried out, of which 17 were routine

TABLE II.—PREOPERATIVE FINDINGS—LABORATORY

	No. cases	*ECG* *Rt. axis deviation*	*ECG* *Rt. ventric. hypertrophy*	*X-ray* *Heart size*	*Laboratory* *Hb.*	*Laboratory* *Hæmatocrit*
		+<150° ++>150°	+moderate ++marked	*N–normal* *I–increased*	+<23 ++>23	+< 60 mm. ++>60 mm.
Tetralogy.....	17	9+	6+	15 N	14+	6+
		8++	11++	2 I	3++	11++
Pentalogy.....	7	5+	5+	1 N	6+	6+
		2++	2++	6 I	1++	1++
Trilogy.....	2	1+	1+	0 N	1+	1+
		1++	1++	2 I	1++	1++

angiocardiograms and eight were selective angiocardiograms. Preoperative and postoperative oximetry was performed in most cases.

A left anterior thoracotomy is carried out in the fifth intercostal space. The left internal mammary vessels are divided and the fourth costal cartilage is sectioned for better exposure. The pericardium is incised longitudinally in front of the left phrenic nerve.

The heart is inspected, noting: (1) the size of the ventricular chambers; (2) the calibre of the pulmonary artery trunk and whether there is any dilatation; (3) whether there is a waist-like constriction at the outflow tract; (4) the extent of secondary coronary artery arborization subepicardially—usually, the coronary ramifications are hypertrophied at the site of a waist-like constriction.

Gentle palpation is then carried out starting on the trunk of the pulmonary artery and proceeding across the valve area downwards over the outflow tract, noting: (1) the exact location and character of the thrill, its maximum point of intensity and the extent of its transmission; (2) the presence or absence of a palpable pulmonary "cone"; (3) whether the infundibular tract is depressible, especially at the sites of any waist-like constrictions.

Pressures are then taken by means of an electromanometer in the pulmonary artery trunk, just below the pulmonary valve, in the infundibulum and at as many levels in the inflow and outflow tracts as are deemed necessary on the basis of the readings and other findings taken together. These are correlated with the preoperative catheterization findings.

It is felt by the authors that the pressure gradient is of greater importance than an isolated pressure reading. Thus the gradient of pressures on either side of an infundibular crest or across the pulmonary valve is of more aid in establishing the site of obstruction than an isolated right ventricular or pulmonary artery reading. Systolic, diastolic and mean pressure readings are taken. The diastolic level has particular significance when either a double infundibular or a combination of infundibular and valvular stenosis is present.

Based on the findings and on the pattern of coronary vessel distribution on the anterior wall of the right ventricle, a site of election is chosen for ventriculotomy. A longitudinal incision is

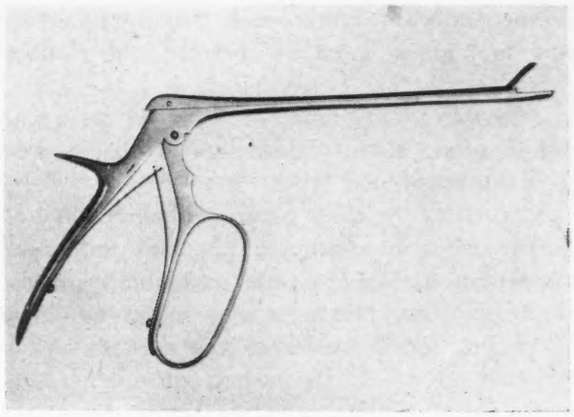


Fig. 1.—Glover rongeur.

Fig. 2.—Diagram of rongeur resecting infundibulum.

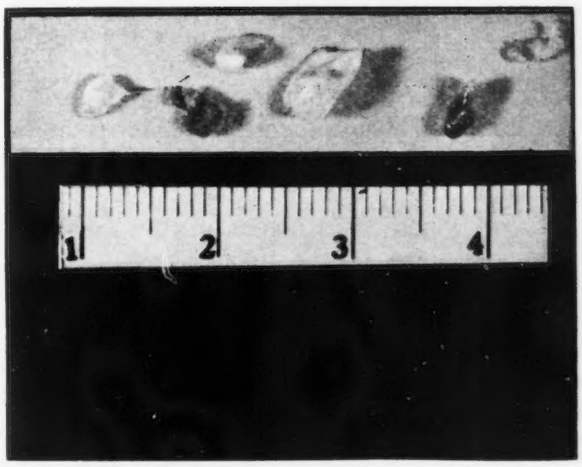


Fig. 3.—Typical pieces of tissue resected from infundibulum.

usually employed between two stay sutures of "0" cotton placed on either side.

The right ventricular cavity is then explored with a ureteral sound, noting at what levels, both above and below the incision, an obstruction is met. An attempt is always made to pass the sound into both the pulmonary artery and the aorta. The sound is then withdrawn.

If the stenosis is purely valvular, a Potts valvulotomy is carried out in the usual manner followed by dilatation. If an infundibular stenosis has been encountered a rongeur of the Glover or Nichols type is introduced and a piece of

fibrous endocardium resected. Usually more than one such piece must be resected, the average being four or five pieces (Figs. 1, 2 and 3).

This infundibulectomy is followed by a valvulotomy as already described if the stenosis is of the combined type.

The heart is then again examined, noting particularly any change in the site and, more important, in the character and quality of the thrill palpated. Pressures may again be taken at various levels by either the surgeon or an assistant to assess the extent of amelioration while digital pressure ensures hæmostasis at the site of ventriculotomy. Oximeter readings will also usually show a distinct improvement in the oxygen saturation of the blood comparable with the improvement in the patient's coloration.

When the surgeon is satisfied that the maximum amelioration has been achieved, the ventriculotomy incision is closed with two or three simple sutures of "00000" Deknatel. Cotton stay sutures are removed and the chest is closed in the routine manner. The cotton stay sutures are not tied in closing the ventriculotomy incision, because this may reproduce the infundibular obstruction.

It is interesting to correlate the nature of the pulmonary obstruction encountered in the three types of Fallot's malformation. In the tetralogies, there were 10 cases of valvular stenosis, of which seven were of the combined type and three of the isolated valvular type. Of the seven cases of combined forms of obstruction, that is, associated valvular and infundibular obstruction, six were found to have a single infundibular obstruction and in one case two infundibular crests were encountered in addition to the valvular stenosis. There were seven cases of isolated infundibular stenosis among the tetralogies, of which two cases had double infundibular crests. Thus a total of 14 cases showed an infundibular stenosis out of 17 cases of tetralogy.

Among the seven cases of pentalogy there were three cases of pure valvular obstruction, two cases of pure infundibular obstruction, and two cases wherein both a valvular and an infundibular obstruction were encountered. Finally, in the cases of trilogy, one case of pure valvular stenosis and another case of combined type were found.

From these findings it appears that in tetralogy an infundibular obstruction, either pure or combined with a valvular obstruction, is somewhat more common, while a valvular obstruction either pure or combined with an infundibular obstruction is slightly more common in pentalogy and trilogy.

Pressure readings and oxygen determinations were taken preoperatively and during the operation, both before and after the direct relief of the pulmonary obstruction. Catheterizations have been carried out one year postoperatively so far in nine cases, thus affording us an opportunity to evaluate the change in the hæmodynamic pattern after surgery. Average readings indicate a rise in systolic and diastolic pressures in the pulmonary artery trunk immediately after surgical relief during the operation, with a subsequent fall to a lower level at the time of postoperative catheterization, although the readings are still significantly higher than preoperative levels—18.6 compared to 7.6 mm. Hg systolic preoperatively and 6.3 compared to 2.2 mm. Hg diastolic preoperatively.

Postoperative catheterizations revealed little change in pressures in the infundibulum except for a slight drop in the average diastolic pressure after surgery (from 5.2 mm. Hg to 2.5 mm. Hg). The systolic pressures remained unchanged to any significant degree, and if anything were actually higher than before.

The same findings hold true in the inflow tract, there being a drop in the average diastolic pressure from 9.8 mm. Hg preoperatively to 3.1 mm. Hg postoperatively. The systolic pressures on the other hand are relatively higher postoperatively.

A significant change in average peripheral arterial oxygen saturation is noted at the time

TABLE III.—ANATOMO-PATHOLOGICAL FINDINGS

	Infundibular		*Valvular*	*Combined*		*Total*
	Single	*Double*		*Single infundibular*	*Double infundibular*	
Tetralogy	5	2	3	6	1	17
Pentalogy	2		3	2		7
Trilogy			1	1		2
Total	7	2	7	9	1	26

of operation, from 80.6 vol. % to 91.1 vol. % following direct relief of the pulmonary obstruction.

It is felt by the authors that a comparison of the pressure readings preoperatively, peroperatively and postoperatively while somewhat indicative of improvement can in no sense be related to the actual clinical and subjective improvement noted, as will be shown later.

TABLE IV.—OVER-ALL POSTOPERATIVE RESULTS

	No.	*%*
Cases operated on	26	100
Markedly improved	17	65.4
Moderately improved	1	3.8
No improvement	0	0
Deaths	8	30.7

Of the 26 cases operated on, 17 or 65.4% showed a marked improvement, and one case (3.8%) showed only moderate improvement because of pulmonary complication. There were eight deaths, a mortality rate of 30.7%.

TABLE V.—CAUSES OF DEATH

	Preventable	*Non-preventable*
Operative	1—(G.D.)—2nd Inf. crest	1—(R.L.)—Hæm. & arrest
Postoperative	1—(M.V.)—Inf. crest	1—(S.C.)—Broncho-pneum. Atelectasis & pleurisy.
	2—(D.P.)—Rt. pneumothorax	
	3—(G.L.)—Inf. crest. (stay sutures).	
	4—(C.B.—Bronch. asp.	
	5—(L.L.)—Bronch. asp.	

The causes of death were classified as operative and postoperative and again as preventable and non-preventable. There were two operative deaths, of which one was considered preventable. This patient (G.D.) was found at operation to have a tetralogy with valvular and infundibular stenosis, and a combined procedure was carried out. She developed cardiac arrest on the table and could not be resuscitated. Post-mortem examination revealed a second infundibular crest which had been overlooked at the time of operation. The other operative death was considered non-preventable. This patient (R.L.), a man 27 years of age, had a tetralogy with a pure infundibular stenosis. The infundibulum itself was calcified and the tonus of the myocardium was very poor. Massive uncontrollable bleeding terminated in cardiac arrest.

There were six postoperative deaths, of which five were considered preventable. One patient (M.V.) developed cardiac arrest during the operation. Heart beat was restored but the patient never regained consciousness and died on the first postoperative day. This was a case of tetralogy in which a valvular stenosis was found and relieved at surgery. Post-mortem examination revealed an infundibular crest which had been overlooked. Another case (D.P.) was a case of tetralogy with a pure infundibular stenosis. This patient went into shock three hours after operation because of congenital absence of the pericardium with resultant subluxation of the heart. He died 48 hours postoperatively from a right-sided pneumothorax. A third patient (G.L.), with tetralogy, was found to have a valvular stenosis at the time of operation. One hour postoperatively the patient developed cardiac arrest. Post-mortem examination revealed an associated infundibular stenosis which had been overlooked at the time of operation and which indubitably had been further constricted by the tying of the cotton stay sutures over the ventriculotomy incision. A fourth patient (C.B.), with trilogy with valvular and infundibular stenosis, expired suddenly on the fourth postoperative day immediately after an endobronchial aspiration. The fifth preventable death (L.L.) was in a case of pentalogy with a pure infundibular stenosis, and this patient also died suddenly 48 hours postoperatively, immediately after endobronchial aspiration. One postoperative death (S.C.) was considered non-preventable. This was a case of tetralogy with a pure valvular stenosis where the patient's condition deteriorated suddenly two weeks after operation, with pallor, cyanosis, loss of consciousness, convulsions and death. The post-mortem examination revealed bronchopneumonia, atelectasis and a left-sided pleurisy. Clinically it was felt that the child had suffered a cerebral embolism, but this was not substantiated at autopsy.

In summary, there were two deaths considered by the authors to be non-preventable, while six deaths were classified as preventable. Of these six deaths, three resulted early in our surgical experience from overlooking infundibular crests, one of these being a double crest; two deaths resulted from over-solicitous endobronchial aspiration producing cerebral and myocardial anoxia and initiating vago-vagal reflexes with subsequent cardiac arrest; finally, one patient died from a right-sided pneumothorax.

The clinical improvement postoperatively is even more striking when one considers that nine cases out of 11 of tetralogy (81%) and four cases out of six of pentalogy (66%) show no cyanosis. Eight out of 11 cases of tetralogy (72%) and five out of six cases of pentalogy (83%) show no clubbing. Ten out of 11 cases of tetralogy (90%) and 100% of the cases of pentalogy have no dyspnœa. Again, 10 out of 11 cases (90%) of the tetralogy and 100% of those with pentalogy tolerate exercise well.

The ECG shows diminished right ventricular hypertrophy in seven out of 11 cases (63%)

TABLE VI.—POSTOPERATIVE STATUS. Follow-up 6 - 18 months (1 case = 4 years)

	Survivals	*No cyanosis*	*No clubbing*	*No dyspnoea*	*Good exercise tolerance*	*ECG diminished R.V.H.*	*Normal Hb*	*<50 Hæmatocrit*
Tetralogy.....	11	9 (81%)	8 (72%)	10 (90%)	10 (90%)	7 (63%)	11 (100%)	11 (100%)
Pentalogy.....	6	4 (66%)	5 (83%)	6 (100%)	6 (100%)	4 (66%)	6 (100%)	6 (100%)
Trilogy.....	1	1	1	1	1	1	1	1

of tetralogy and four out of six cases (66%) of pentalogy. Radiologically, the cardiac shadow was enlarged in only two cases of pentalogy, while none of the cases of tetralogy showed any enlargement. These results compare favourably with the enlargement usually observed after shunt procedures. The hæmoglobin level has returned to normal and the hæmatocrit has fallen to below 50 mm. in all cases of tetralogy and pentalogy.

The one patient with trilogy of Fallot who survived shows marked improvement with no evidence of cyanosis, clubbing, or dyspnœa and with good exercise tolerance. In addition, the electrocardiogram shows diminished ventricular hypertrophy, while the hæmoglobin has returned to a normal level and the hæmatocrit has fallen to normal.

In conclusion, the authors feel that while the procedure described is a "blind" one it obviates the necessity of surgically creating an additional anomaly, as in a shunt procedure. Considering that six out of eight deaths were preventable, it is conceivable that with our present experience the procedure can be undertaken with a lower mortality rate. The follow-up bears out the value of the procedure, as the clinical benefits seem to be maintained.

Since it is a "blind" procedure, the authors feel that it should be reserved for those patients who are too ill to await open cardiac surgery. Our experience with open cardiac surgery has not yet reached the clinical stage, but we hope in the very near future to be able to attack this problem under direct vision.

ADDENDUM

Since this article was submitted for publication, open cardiac surgery has been successfully performed at the Montreal Institute of Cardiology and will be utilized when indicated for the correction of these malformations, particularly of infundibular type.

RÉSUMÉ

Les auteurs font part de l'expérience acquise dans le traitement chirurgical de 26 cas de cardiopathie congénitale, de Fallot. Le plus grand danger auquel sont exposés les cas de tétralogie est l'anoxémie, alors que la défaillance cardiaque est la menace qui pèse sur les cas de trilogie. Après avoir exposé les différentes épreuves sur lesquelles on base le diagnostic préopératoire, la technique de l'intervention est décrite dans ses grandes lignes. La mortalité de cette série s'éleva à 30.7% (8 malades). Les trois quarts de ces morts auraient pu être évitées avec une plus grande expérience clinique et par la modification de certains soins post-opératoires. Les 18 malades qui survécurent ont tous accusé une amélioration quelconque, soit dans la tolérance à l'effort, l'amélioration de la dyspnée ou de la cyanose, ou dans un retour à la normale du niveau d'hémoglobine et de l'hématocrite. Les auteurs croient qu'avec les perfectionnements apportés à leur technique depuis la publication de cette série, l'intervention telle que décrite reste la meilleure tant que la chirurgie à cœur ouvert ne sera pas encore du domaine clinique.

HEALTH EDUCATION

". . . Some of our colleagues feel that health teaching of a formal variety is something in the nature of high-pressure salesmanship, suspect and better left in the hands of zealous laymen. With this view no one here present will agree; but despite this the medical profession as a whole has shown little inclination to teach the prevention of disease in compelling style. This may have arisen in several different ways. The doctor may have had no access to the patient in the preventable stage of the disease, or he may have thought that the ailments of family practice were, in the main, not preventable. Further, he may have thought that an occasional remark in the family circle might suffice to influence his patients' attitudes and conduct. Skill in the techniques of group teaching he has rarely had; nor would he welcome the suspicion of self-advertisement that these would entail."

". . . I hope to show that none of these views is tenable, and that even if all were tenable then at the last ditch it should be maintained that our profession is in danger of losing a vast store of public goodwill by leaving this field open to others."—H. Shannon, *M. J. Australia*, 1: 857, 1957.

THE TREATMENT OF PERFORATED PEPTIC ULCER—IS A CHANGE DUE?*

E. A. J. McKITTRICK, M.D., and
BURNS PLEWES, F.R.C.S., *Toronto*

It has been suggested that the treatment of perforated peptic ulcer is either too conservative or too radical. Roscoe Graham taught that the surgeon's business in treating perforated ulcer was to save the patient's life, not to treat his ulcer, and that he should do this by treating shock and patching the defect with a free or attached omental graft. Critics have suggested two opposing views:

1. Non-operative treatment by nasogastric suction and support.

2. Immediate partial gastrectomy.

To have a basis for discussion of these more recently advocated treatments, a study was made of 100 consecutive cases of perforated ulcer admitted to the Toronto East General Hospital between 1949 and 1954 and treated by attending and resident staff as well as non-staff surgeons.

The series seems average. Of the 100, 74 had an "ulcer history", 9 had had previous complications (4 perforation, 3 obstruction, 2 hæmorrhage), and 11 were women. In two of the cases (not operated upon) the exact location of the ulcer was uncertain; in 4 it was pyloric, in 11 gastric and in 83 duodenal. The average stay in hospital was 12½ days.

TABLE I

Age	*No. of cases*	*Deaths*	*Mortality*
20 - 29	14	0	0
30 - 39	18	0	0
40 - 49	29	0	0
50 - 59	18	1	6%
60 - 69	15	2	13%
70 - 79	6	2	33%
Totals	100	5	5%

Treatment

Operative treatment was carried out in 93 of the 100: in 88 within 24 hours of perforation. Of the 7 not operated upon, 3 were moribund on admission and died, and, in 4, more than 24 hours had elapsed since perforation and signs of localization were present, so that they were treated by suction and intravenous therapy. One had drainage of an abscess of Morison's pouch two weeks after perforation, and all four recovered. Table I shows that the 5 deaths occurred in those over 50 years old. The operative procedure was closure of the perforation by an omental graft, to which a gastroenterostomy was added in one case because pyloric obstruction seemed imminent.

TABLE II.—Postoperative Complications

1.	Wound dehiscence	4
2.	Ileus	3
3.	Urinary retention or cystitis	3
4.	Pulmonary (pneumonia, atelectasis or pleurisy with effusion)	13
5.	Hæmorrhage (gastric)	1
6.	Thrombophlebitis	1
7.	Blowout of patch	1
8.	Wound infection	1

Postoperative complications developed in 21 cases (Table II).

Further operations for duodenal ulcer were performed at the Toronto East General Hospital in 9 cases, as follows:

Case 1.—Male, age 43, who had had a perforation of a duodenal ulcer several years previously. When the second perforation occurred he was admitted to this hospital and the perforation closed with an omental patch. Ulcer symptoms recurred 7 months after this second episode and partial gastrectomy was performed 10 months later.

Case 2.—Male, duodenal ulcer, age 38. He developed pyloric obstruction one year later and partial gastrectomy was performed.

Case 3.—Female, duodenal ulcer, age 38; 9 months later developed pyloric obstruction and underwent partial gastrectomy.

Case 4.—Male, age 61, was admitted for bleeding duodenal ulcer. Barium meal performed 8 days after admission and perforation of the ulcer occurred the next day. Repair was carried out. Subtotal gastrectomy was performed 8 months later.

Case 5.—Male, duodenal ulcer, age 38. Persistent ulcer symptoms continued after closure. Partial gastrectomy was performed 7 months later.

Case 6.—Male, duodenal ulcer, age 68. Perforated duodenal ulcer found already plugged with omentum at the time of operation and incipient stenosis was present. The patient's general condition was not good and gastroenterostomy was performed.

Case 7.—Male, age 50. Two previous episodes of perforation. Subtotal gastrectomy was performed 11 days after emergency closure of the perforation during the same hospital admission.

Case 8.—Male, duodenal ulcer, age 48. Was admitted 8 months after the perforation with severe gastric hæmorrhage, and an emergency subtotal gastrectomy was necessary.

*Delivered before the Annual Meeting of the Ontario Medical Association, Toronto, May 1957.

Case 9.—Male, duodenal ulcer, age 68. Four months later, subtotal gastrectomy was performed for obstruction.

There were 5 deaths in this series:

1. Male. Age 65. Ruptured duodenal ulcer. Operation 72 hours after admission; death occurred on the 9th postoperative day. Probable cause of death generalized peritonitis, in spite of antibiotics and supportive therapy.
2. Male. Age 54. Appendectomy was performed at the same time as a repair of a ruptured duodenal ulcer. Wound dehiscence occurred on the 6th postoperative day. There was a gradual rise in temperature and pulse rate following this episode and the patient died on the 11th postoperative day. It is felt that the addition of appendectomy probably contributed to the fatal outcome.
3. Male. Age 64. This patient had a history of pyloric obstruction with vomiting and loss of weight for one year before rupture. Actual rupture occurred 4 hours before admission, at which time he was in shock and in very poor general condition. Gastric suction and supportive therapy were instituted but his condition could not be improved sufficiently for anæsthesia and surgery. The patient died 40 hours after admission.
4. Female. Age 70. Admitted in a moribund condition with history of epigastric pain for one week. The patient died one hour after admission; at autopsy a perforated duodenal ulcer with generalized peritonitis was found.
5. Male. Age 75. Admitted in almost moribund condition and died the following day. Autopsy showed a perforated duodenal ulcer with generalized peritonitis. This must have been present long before treatment was begun.

Discussion

The results of the present treatment of ruptured peptic ulcer in a 500-bed hospital by a variety of surgeons show a mortality rate of 5% and the rather high complication rate of 20%. The principle that treatment should be directed at the complication of peritonitis by an operation to patch the perforation as soon as shock is controlled was followed. None of the deaths seemed due to the operation, for 3 out of 5 represented failures in resuscitation and the patient was not operated on at all, and there was evidence of delay in diagnosis in the other two, for the operation was late. Improvement in the mortality rate here implies improvement in early diagnosis and in the treatment of shock. There were no deaths in the patients under 54 years of age (two-thirds of the series).

At least 9 patients required further surgical intervention for their ulcer within a year of perforation. Others may have had gastrectomy or vagotomy at other hospitals, but 95% survived.

What would have happened to these patients if they had not been operated upon? Four out of the seven so treated survived, but it is hard to believe that naso-gastric suction will always prevent further leaking, especially when the blowout is large and beyond the pylorus. Inflammatory œdema is often observed to be occluding the pylorus, and cartilage-hard induration around a large hole in the anterior duodenal wall makes plugging by surrounding omenta and viscera doubtful. Certain complications such as wound dehiscence and infection would be avoided. The hazard seems greater than the risk of a short anæsthetic in the vast majority of patients.

What would have happened if immediate gastrectomy had been performed in many of these cases? Certainly the mortality rate would not have been lowered, for it is doubtful whether the most enthusiastic advocate of gastrectomy would have proceeded with the longer operation in the older age group in which all the deaths occurred. The hazards of postoperative leaking suture lines and hæmorrhage when duodenal stumps are closed and anastomoses performed in the presence of inflammation and infection would be added to those encountered in the operations of election. There is also the post-gastrectomy syndrome to increase the morbidity rate. Immediate gastrectomy for perforated ulcer would be warranted only for the young man with a long history of indigestion but with peritonitis of short duration, who is fortunate enough to have a surgeon expert in the operation, an experienced anæsthetist and operating-room team, in a hospital with a well-stocked blood bank.

Summary

A review of the results of the present treatment of perforated duodenal and gastric ulcer shows a low mortality, 5%, with all the deaths occurring in patients over 50 years of age. All deaths were due to delay in diagnosis or in treatment.

Further surgical treatment was necessary in 10% at least, and complications were noted in 20%.

The hazards to be overcome, if a change is entertained in the fundamental attitude towards treatment, either toward "conservatism" or "radicalism", are discussed.

References

1. Graham, R. R.: Surgical Therapy in Lesions of the Stomach and Duodenum, *In*: Surgical treatment of the abdomen, edited by F. W. Bancroft and P. A. Wade, J. B. Lippincott Company, Philadelphia, 1947, p. 493.
2. Bingham, D. L. C.: *Canad. M. A. J.*, 58: 1, 1948.
3. Taylor, H. and Warren, R. P.: *Lancet*, 1: 397, 1956.

RÉSUMÉ

L'auteur rappelle les données actuelles du traitement de l'ulcère duodénal ou gastrique perforé. La mortalité est de l'ordre de 5% et frappe les sujets de plus de 50 ans. Elle dépend entièrement du retard apporté au diagnostic ou au traitement. On observa des complications dans 20% des cas de la présente série et l'intervention dut être reprise chez au moins 10% des sujets du groupe. Les risques que l'on aurait à courir si l'on devait modifier d'une manière fondamentale notre façon d'aborder le problème sont exposés dans le texte.

HOSPITAL STAPHYLOCOCCI*

J. E. JOSEPHSON, M.D., C.M., B.Sc.(Med.), F.A.C.P. and RALPH W. BUTLER, B.A., M.Sc.,
St. John's, Nfld.

AN EVER-INCREASING frequency in hospital infections due to staphylococci has been reported during the past decade. Although our hospital itself had not experienced any serious outbreak of staphylococcal infection, we felt it worth while to conduct a staphylococcus survey in an attempt to determine the prevalence and type of *Staphylococcus pyogenes aureus* within our walls.

We feel, as others do who have conducted similar surveys, that present methods for the control of staphylococcal infections are at times far from satisfactory. We are handicapped by the ubiquitous distribution of this organism as well as its ability to remain viable for long periods of time under adverse conditions. A further problem exists in the treatment of infections, since most strains, particularly those found within hospitals, are showing resistance to increasing numbers of our commonly employed therapeutic agents.

The most serious staphylococcal infections probably occur within hospitals. Blowers *et al.*[1] made an extensive study of a thoracic surgery unit which had been closed because of frequency of wound infection caused by penicillin-resistant *Staphylococcus aureus*. Remedial measures undertaken decreased infection rate from 10.9 to 3.9%. Marked reduction was also reported in the number of carriers among patients and staff. They concluded that the infecting organisms were airborne and that most of the infections occurred at the time of operation. Brodie[2] reported findings derived from a study of the complications occurring during a therapeutic trial of antibiotics in bacillary dysentery in a hospital for infectious diseases. They noted "scarlet fever", sore throats without rash, and gastro-enteritis as the main complications of oxytetracycline and tetracycline therapy. Results obtained when using certain typing methods led these workers to feel that the complications of therapy were caused by cross-infection with a "hospital" staphylococcus of a defined type. From this they suggested that the control of staphylococcal cross-infection may depend not on a search for staphylococcal carriers in general but on the recognition of carriers of defined types of proven pathogenicity. Barber and Burston[3] stated that it seemed at least possible that staphylococci in an infective process become more virulent than those carried in the nasopharynx, or that staphylococci harboured in the nasopharynx tend to become less virulent. They felt that the presence of one or more open infections on a ward would probably be more dangerous than the presence of many nasal carriers. Murray and Calman[4] are of the opinion that the incidence of staphylococcal infection in babies born in a maternity hospital is related to the prevalence of carriers of the staphylococcus among nurses, and to quote Colebrook,[5] commenting on hospital infections, "The increasing number of hospital inmates, both patients and staff, who are harbouring staphylococci resistant to antibiotics in their noses, without manifest signs of infection, offers another difficult problem, for there is little doubt that these nose carriers bear an important relation to the rising tide of staphylococcal cross-infection of wounds."

Starkey[6] in an extensive report on the control of staphylococcal infections in hospitals discussed sources, depots, and modes of conveyance of the organism. His conclusion was that, on the basis of there being no known cure-all, a systematic re-checking of all our existing methods would seem to be the only practical approach.

The present work includes results of antibiotic sensitivity testing and bacteriophage typing of strains isolated from a staphylococcus survey of hospital staff, hospital patients, and hospital air, as well as strains isolated from staphylococcal

*From the Department of Pathology, The General Hospital, St. John's, Newfoundland, and The Newfoundland Public Health Laboratories.

infections. A group of out-patients, not closely associated with a hospital environment, were included in this study for purposes of comparison.

METHODS AND MATERIALS

Nasal Carriers:

Swabs were taken from both anterior nares in each case using a swab moistened with ordinary nutrient broth. Within two hours, each swab was first spread over the surface of a nutrient agar plate containing 4% human blood, then over the surface of a nutrient agar plate containing 7.5% NaCl, and finally the applicator stick was broken off aseptically approximately one inch from the end to permit culture of the entire swab in nutrient broth containing 10% NaCl. We included 10% NaCl nutrient broth and 7.5% NaCl agar in our cultural methods as selective media. The addition of 7.5% NaCl to solid culture media was described by Chapman[7] as inhibiting most bacteria other than staphylococci. Maitland and Martyn[8] found that 10% NaCl was the most practical amount to be added to broth for the selective isolation of staphylococci. All media were incubated at 37° C.

Blood agar plates were examined after 24 hours' incubation and representative staphylococcal-like colonies were sub-cultured to nutrient agar slopes. No effort was made to isolate more than one strain of staphylococcus from one nasal swab except when colonies showed variation in size or in degree of pigment production.

When staphylococci could not be isolated from blood agar plates, either due to lack of growth or due to confluent growth, the NaCl plates were examined after 48 hours of incubation. At this time if NaCl plates also failed to yield satisfactory cultures of staphylococci, the NaCl broth culture was seeded on a blood agar plate. In the case of confluent growth patterns on the primary plates, plating of the broth frequently aided in producing discrete colonies.

Strains isolated on agar slopes were first checked for purity of culture, and afterwards coagulase testing, antibiotic sensitivity testing, and bacteriophage typing were carried out.

Coagulase tests were made on each strain using both the slide test as outlined by Stokes[9] and the test tube method as recommended by Mackie and McCartney.[10]

Hospital Air:

Isolation of *Staphylococcus pyogenes aureus* from hospital air was made by exposing blood agar settle-plates. This was done throughout the entire hospital including operating suite, recovery rooms, private rooms, semi-private rooms, wards and corridors. Following incubation all colonies on settle-plates suspected of being *Staphylococcus pyogenes aureus* were subcultured to agar slopes.

When more than one coagulase-positive colony was isolated from an exposed plate, the problem arose whether each was a different strain or not. Obviously when many colonies occurred phage typing posed a procedure of considerable magnitude. Under these circumstances we decided to rely on sensitivity patterns as a means of differentiation. Therefore, those coagulase-positive *Staphylococcus pyogenes aureus* colonies isolated from the same settle-plate and possessing identical antibiotic sensitivity patterns were assumed to be the same strain, and only one representative of such colonies was submitted to phage typing for inclusion in our statistics.

Hospital Infections:

All coagulase-positive staphylococci isolated from cases of infection within the hospital during the survey were included. These cases were made up of patients admitted to hospital with a staphylococcal infection, as well as those who acquired their infection during hospitalization. The organism was usually isolated during routine examination of specimens submitted to the clinical bacteriological laboratory.

Sensitivity Testing:

Sensitivity testing was done by the disk technique. Cultures were spread over 4% blood agar infusion plates, and disks of the following six antibiotic agents in the concentrations appended were placed upon the surface: penicillin 1.5 units; aureomycin 10 μg.; chloramphenicol 10 μg.; streptomycin 10 μg.; terramycin 10 μg.; and erythromycin 10 μg. Readings were made after 18-20 hours of incubation.

Bacteriophage Typing:

Attempts have been made to recognize specific types of coagulase-positive *Staphylococcus pyogenes aureus.* One of the methods employed has been agglutination testing, but so far this method has apparently not produced a satisfactory breakdown of the species into recognizable stable

types. Recent work indicates that lysis by specific phages offers the best method of identification of strains of *Staphylococcus aureus* and is at present the most widely accepted procedure. A description of routine methods of bacteriophage typing of *Staphylococcus aureus*, and an analysis of results of the typing, is outlined in a paper by Williams and Rippon.[18]

Bacteriophage typing was performed for us by the Laboratory of Hygiene, Ottawa, which is a national centre for bacteriophage typing of staphylococci in Canada. Phage typing was in strict accord with the recommendations of the International Committee,[17] using a basic set of 19 phages plus phages 81 and 44A which are now considered by the Committee to be in the "Miscellaneous" group. In addition to the 20 internationally recognized phages, the Laboratory of Hygiene included two others, namely 52AV and VA4. Phage 52AV was one adopted by them from 52A. In a personal communication, Bynoe[11] of the Typing Center advised that 52AV should not be confused with Rountree's 52AV which is now known as type 80, and that their 52AV is classified in Group I. He also advised that VA4, isolated by Blair of New York, belongs in Group III.

Phage 52AV was used routinely, but VA4 was used only when the routine phages showed no lytic action on the strain being tested.

The grouping of the phages used was as follows:

Group I	29, 52, 52A, 79, (52AV)
Group II	3A, 3B, 3C, 55.
Group III	6, 7, 42E,47, 53, 54, 70, 73, 75, 77, (VA4)
Group IV	42D
Miscellaneous group	81, 44A.

RESULTS

During the survey 440 coagulase-positive staphylococci were isolated. This figure includes 243 from symptomless nasal carriers, 141 strains from hospital air, and 56 strains from clinical material forwarded to the laboratory from patients within the hospital. An investigation of certain staphylococcus "depots", such as blankets, was made also but this work is still in progress and will probably be dealt with in a separate paper.

NASAL CARRIERS

Carrier Rates

Symptomless nasal carriers were sub-divided into five groups: staff doctors and graduate nurses; student nurses; nursing assistants; in-patients; and out-patients. Table I demonstrates the carrier rate as determined for each group.

TABLE I.—NASAL CARRIERS

Source	*No. tested*	*No. carrying coagulase-positive staphylococci*
Staff doctors and graduate nurses	82	39 (48%)
Student nurses	104	50 (48%)
Nursing assistants	83	40 (48%)
In-patients	141	59 (42%)
Out-patients	109	55 (50%)

Figures in Table I indicate little difference in the carrier rate among hospital staff, in-patients, and out-patients. It will be noted that 42 to 50% of all groups carried coagulase-positive staphylococci in their anterior nares.

All first-year, second-year and third-year nurses-in-training within the hospital were investigated. Whereas 48% of the total were carriers, the first-year students had a lower carrier rate than those in their third year. There was very little difference between the carrier rates of second and third year students (Table II).

TABLE II.—NASAL CARRIERS (NURSES-IN-TRAINING)

Source	*No. tested*	*No. carrying coagulase-positive staphylococci*
1st year student nurses	49	21 (43%)
2nd year student nurses	25	13 (52%)
3rd year student nurses	30	16 (53%)
Total	104	50 (48%)

Resistance of Carrier Strains to Antibiotics

A high percentage of *Staphylococcus pyogenes* strains isolated from symptomless nasal carriers working within the hospital were resistant to penicillin (Table III). Among the 269 hospital personnel examined, 129 or 48% were nasal carriers, and of this number 115 (89%) were resistant to penicillin. Twenty-nine per cent were resistant to streptomycin; 14% were resistant to terramycin; and 14% were resistant to aureomycin. No symptomless carrier on the staff carried strains with resistance to either chloramphenicol or erythromycin.

Phage Typing of Carrier Strains

Of the 129 nasal carriers on the hospital staff, 22 were carriers of phage Group I strains; 38 car-

TABLE III.—ANTIBIOTIC RESISTANCE OF STRAINS ISOLATED FROM CARRIERS, HOSPITAL AIR, AND FROM CASES OF INFECTION

Source	No. tested	No. Pos. for Coag. Pos. Staph.	Resistant to: Penicillin	Streptomycin	Terramycin	Aureomycin	Chloramphenicol	Erythromycin
Symptomless nasal carriers on hospital staff	269	129 (48%)	115 (89%)	37 (29%)	19 (14%)	18 (14%)	—	—
Hospital air	—	141 strains	108 (77%)	67 (48%)	59 (42%)	43 (30%)	4 (3%)	—
In-patients (random)	141	59 (42%)	47 (80%)	25 (42%)	27 (46%)	26 (44%)	—	1 (2%)
Out-patients	109	55 (50%)	26 (47%)	1 (2%)	6 (11%)	6 (11%)	—	—
Clinical isolation from cases of infection within hospital	56	56	44 (79%)	16 (29%)	25 (45%)	24 (43%)	1 (2%)	—

ried phage Group II; 22 were of Group III; and 15 were in the Miscellaneous Group. Eighteen strains failed to fall into any one particular group, and 14 were untypable (see Table IV).

The majority of Group I strains were lysed by phages 52 and (or) 52A. The 38 Group II strains were all lysed by phage 3A, with 24 of the pattern 3A/3C; 13 of pattern 3A only, and 1 of pattern 3A/3B/3C/55. Although a high percentage of Group III strains were lysed by phages 75 and (or) 77, there was no one predominant pattern. Various combinations of the 11 Group III phages occurred. All strains classified as Group 1/M (nine in number) were of pattern 52/52A/81. Group III/M strains were lysed by at least five phages of Group III plus phage 81 of the Miscellaneous Group.

CASES OF STAPHYLOCOCCAL INFECTION

During the period in which this survey was being conducted, 56 proven cases of staphylococcal infection were diagnosed in in-patients of the hospital. A study of each patient's clinical chart revealed that 36 had their infection on admission, while 20 cases were of institutional infections acquired in some unexplained fashion during stay in hospital.

Antibiotic Resistance of Strains Isolated from Cases of Infection

Of the 56 strains isolated from cases of infection 79% were resistant to penicillin; 45% resistant to terramycin; 43% resistant to aureomycin; and 29% resistant to streptomycin. Only one strain was resistant to chloramphenicol. All were sensitive to erythromycin.

The sensitivity patterns of the strains isolated from cases classified as "admission infections" contrasted sharply with the sensitivity patterns of strains isolated from cases classified as "institutional infections". Twenty-one per cent of the 56 strains were sensitive to all six antibiotics and these were all strains "admitted" into the hospital. "Institutional" infections were in all cases caused by strains possessing resistance to one or more of the six antibiotics used. In actual fact it was found that of the 20 strains responsible for institutional infections 65% showed resistance to three or more antibiotics; while of the 36 strains isolated from admitted cases of *Staphylococcus aureus* infection only 33% possessed resistance to three or more antibiotics. An even greater difference exists when the strains possessing resistance to four or more antibiotics are compared. Thirty per cent of the "hospital" strains fell into

TABLE IV.—THE OCCURRENCE OF PHAGE GROUPS FROM VARIOUS SOURCES

Source	No. of strains	Phage group I	II	III	M	I/M	I/III	III/M	I/III/M	I/II/M	III/IV/M	Non-typable
Symptomless nasal carriers on hospital staff	129	22	38	22	15	9	2	5	—	1	1	14
In-patients (random)	59	11	8	15	15	4	—	3	1	—	—	2
Out-patients	55	3	21	13	6	3	—	3	1	—	—	5
Hospital air (plate exposure)	141	28	14	30	38	13	—	15	—	—	—	3
Cases of staph. infection	56	5	8	9	21	3	—	6	1	—	—	3
Total	440	69	89	89	95	32	2	32	3	1	1	27

this latter group, as compared with less than 3% of the "admission" strains (Table V).

TABLE V.

Classification of infection	*Total*	*Sensitive to all antibiotics*	*Resistant to:*				
			*1**	*2**	*3**	*4**	*5**
Institutional	20	0	3	4	7	6	0
Admission	36	12	8	4	11	0	1

*Number of antibiotics.

Phage Types Found in Cases of Infection

The 56 strains isolated from the 56 cases of infection showed the following phage grouping: five strains were in Group I; eight in Group II; nine in Group III; 21 were classified in the Miscellaneous Group; 10 were lysed by "mixed" groups and three were untypable (Table IV).

Of the five strains in Group I, three were lysed only by phage 52AV, and of the remaining two, one showed the pattern of 52/52A, and the other 29/52/52A.

Group II strains were of three phage patterns. Of the eight strains in this group five were of pattern 3A/3C, two possessed pattern 3C/55, and one was lysed only by phage 3C.

The nine strains of Group III were lysed by various combinations and numbers of phages; however, it is rather interesting to note that all strains with the exception of one in the group were lysed by phage 77.

As can be seen from Table IV, a high percentage of the strains isolated from cases of staphylococcal infections were classified as "Miscellaneous". The predominant pattern within this group was phage type 81 alone, which occurred in 17 strains. One of the 21 strains was lysed by phage 81 plus another "Miscellaneous" phage. Of the remainder of the strains from the cases of infection, three as noted were untypable, but the other 10 strains were lysed by phage 81 in combination with phages of other groups.

It is perhaps worthy of mention that 28 (50%) of all strains isolated from infections were lysed by either phage 81 alone or by 81 in combination with other phages.

HOSPITAL AIR

From 164 blood agar settle-plates exposed at various sites throughout the entire hospital we isolated 141 strains of coagulase-positive staphylococci.

Antibiotic Resistance of Strains Isolated from Hospital Air

Sensitivity tests made on strains isolated from the hospital air showed a high degree of multi-resistance, i.e., resistance to more than one therapeutic agent. Of the 141 strains, 77% were resistant to penicillin; 48% were resistant to streptomycin; 42% resistant to terramycin; 30% resistant to aureomycin; and 3% resistant to chloramphenicol. No strain possessed resistance to erythromycin.

Phage Types Isolated from Hospital Air

Strains isolated from hospital air were grouped as follows: 28 in Group I; 14 in Group II; 30 in Group III; 38 in the Miscellaneous Group; 13 in combinations of Groups I and M; 15 in combinations of Groups III and M; and three nontypable.

Group I strains isolated from the hospital air were of five patterns, namely: 29/52/52A/79; 52/52A; 52AV; 29; and 52A. The frequency for each pattern was 8 strains; 6 strains; 6 strains; 5 strains; and 3 strains respectively.

Pattern 3A/3C was common for strains of phage Group II, being the lytic result for 9 of the 14 strains. Four strains were lysed by phage 3A only, and one strain had a pattern 3C/55.

Group III strains were lysed by various numbers and combinations of phages, no single pattern being common.

Again, as in the case of the staphylococci isolated from infections, the largest number of strains was classified within the Miscellaneous Group. This group, consisting of 38 strains, was fairly evenly divided into two types. Twenty strains were lysed by phage 81 and 18 were lysed by phage 44A.

Thirteen strains were classified as Group 1/M, seven being of phage pattern 29/44A/52/52A, and six of phage pattern 52/52A/81.

The 15 strains classified as Group III/M were not easily divided into any related phage patterns. The "M" classification, however, was in all instances due to lysis by phage 81. Group III phages commonly present in patterns of Group III/M strains were 6; 42E; 54; 75; and 77.

IN-PATIENTS

A total of 141 in-patients were selected at random from wards, semi-private, and private rooms within the hospital. Fifty-nine of this number were nasal carriers of coagulase-positive staphylococci.

Resistance of Strains Isolated from Anterior Nares of In-Patients

Highly resistant strains were isolated from the anterior nares of in-patients. Results were as follows: 80% were resistant to penicillin; 46% to terramycin; 44% to aureomycin; 42% to streptomycin and 2% to erythromycin. All strains were sensitive to chloramphenicol.

Phage Types Carried by In-Patients

Eleven of the strains isolated from in-patients were of Group I, and of these five had a phage pattern of 52/52A. No other pattern was common.

Group II strains, totalling eight in number, included two of phage pattern 3A, and two of pattern 3A/3C. The remaining four were all different.

The Group III strains, as in other cases, consisted of a mixture of phage patterns. Apart from six strains having a pattern of 7/54/70/77, no two others were alike.

Fifteen of the in-patients tested carried strains of the Miscellaneous Group. Of these, 13 were lysed by phage 81 only, and one was lysed by phage 81 as well as by 42C. The remaining strain was lysed by phage type 44A.

As shown in Table IV, eight strains isolated from in-patients were lysed by phages belonging to more than one group. All of the eight strains so classified were lysed by phage 81. Group 1/M strains were all of pattern 52/52A/81. This is not surprising since 52/52A was the predominant pattern for Group I strains isolated from in-patients.

OUT-PATIENTS

Of 109 out-patients tested, 55 were proven to be nasal carriers. This group was included for purposes of comparison only.

Resistance of Strains Isolated from Out-Patients

Most of the *Staphylococcus aureus* strains carried by out-patients were relatively sensitive to all antibiotics used except penicillin. Resistance to penicillin was shown by 47%. Eleven per cent were resistant to terramycin and aureomycin and only one strain was resistant to streptomycin. All *Staphylococcus aureus* isolated from out-patients were sensitive to both chloramphenicol and erythromycin (see Table III).

Phage Types of Strains Isolated from Out-Patients

Staphylococcus aureus strains isolated from the anterior nares of out-patients were of the following phage groups: 3 in Group I; 21 in Group II; 13 in Group III; 6 in the Miscellaneous Group; 7 were of "mixed" groups; and 5 were untypable.

The three strains classified as Group I were all of different phage patterns.

Two phage patterns commonly occurred among the 21 strains in Group II. Eight strains were of phage pattern 3A/3C, while seven were lysed only by phage 3A. Three other strains had a pattern of 3A/3B/3C/55. The remaining three were all unrelated.

Thirteen Group III strains isolated from out-patients were of nine different phage patterns.

In the Miscellaneous Group, four of the six strains were lysed only by phage 81.

All seven strains lysed by phages of more than one group were lysed by phage 81.

DISCUSSION

The General Hospital in St. John's, Newfoundland, is an institution of approximately 450-500 beds and is the largest hospital in the province. Because it is operated by the Provincial Government, patients are referred to it from all parts of Newfoundland. The patients investigated in this study are therefore representative of a broad section of the province.

The results of this study show very little difference in the nasal carrier rate in doctors, graduate nurses, student nurses, nursing assistants, in-patients, and out-patients. Approximately 50% of each group were found to be nasal carriers of *Staphylococcus pyogenes aureus*. Similar carrier rates were found by Miles *et al.*,[13] who reported percentages of nasal carriers to be 47.4 for out-patients and 64 for nursing staff. Ward patients upon admission were found by them to have a nasal carrier rate of 49.4%, an increase to 54.5% being recorded during their stay in hospital.

Recently Edmunds *et al.*[14] found over 51% of the members of the nursing, medical, and domestic staffs in three maternity units to be carrying *Staphylococcus pyogenes aureus* in their anterior nares. Barber and Burston[3] report a 55% carrier rate for nurses in a maternity unit.

In our study, we found the carrier rate among out-patients to be high, which was contrary to what we had anticipated. Indeed, it was interesting to note that the incidence of carriers amongst our out-patient group was slightly higher than in the other groups investigated, a fact which is difficult to explain since the majority of these people were only casual visitors to the out-patient department who probably attended once only.

Although 48% of all student nurses were nasal carriers (Table II), there was a difference in the carrier rate as determined for the first- and second-year students. Whereas 43% of the first-year students were carriers, the carrier rate amongst the second-year students was 52%. There was very little difference in the second- and third-year students, the latter showing 53% carriers. The majority of the first-year students had entered the Hospital School of Nursing about four to five months before the beginning of this study, and had had little exposure to ward duty. From the difference in carrier rate between the first- and second-year student nurses, it would appear that one might expect approximately a 10% increase in carriers amongst nurses after their first-year residence in hospital. Difference in carrier rate among student nurses was studied by Brodie *et al.*[15] These workers reported an analysis based on a six-months' survey for staphylococcal carriage in a group of 30 nurses from the start of their training within a general hospital. Their frequency of isolation of coagulase-positive staphylococci increased from 27% to 57% after the nurses began ward duty. From this, one may naturally conclude that a higher carrier rate is to be expected as the exposure to hospital environment increases. However, in our study there is an anomaly in this respect between the first-year student nurses who had approximately a five months' exposure to hospital environment, although not on the wards, and out-patients. The latter group, as pointed out, had a carrier incidence of 50%, while the first-year student nurses had 43%. There are no apparent reasons for this difference.

The percentage of strains of *Staphylococcus pyogenes aureus* resistant to therapeutic agents is ever increasing. Eighty-nine per cent of the strains isolated from symptomless nasal carriers on the hospital staff during this study were resistant to penicillin. This figure, when considered with the fact that 29% were found resistant to streptomycin, and 14% resistant to both terramycin and aureomycin, indicates the seriousness of the problem at hand. Fortunately, thus far, strains with resistance to chloramphenicol and erythromycin are not too common. What will happen concerning the "newer" therapeutic antibiotic agents now appearing on the market, and which will appear during the next few years, may well be similar to the experience already encountered with penicillin and streptomycin.

Regardless of source, resistance to the six therapeutic agents used occurred in a rather definite pattern. When a strain possessed resistance to only one antibiotic, it was generally towards penicillin. Ninety-four per cent of our 144 strains showing resistance to only one antibiotic were resistant to penicillin. Of the remaining nine strains, six were resistant to streptomycin only; two were resistant to terramycin only; and one resistant to chloramphenicol.

Resistance to two antibiotics was possessed by 71 strains, and 66 (93%) were resistant to penicillin and streptomycin. Altogether 69 strains were resistant to three agents, and of these 57 were resistant to penicillin, aureomycin, and terramycin. The remaining 12 were resistant to penicillin, terramycin and streptomycin.

Strains showing resistance to four agents totalled 58. All in this category were resistant to penicillin, aureomycin, terramycin and streptomycin.

Only two of the strains isolated possessed resistance to five antibiotics. One had a pattern of resistance to penicillin, aureomycin, terramycin, chloramphenicol and streptomycin; and the other to penicillin, aureomycin, terramycin, streptomycin, and erythromycin. In no instance did a strain show resistance to all six therapeutic agents used.

Table III confirms the generally accepted fact that hospital strains are the most resistant strains. While no great difference existed in the carrier rates determined for hospital staff, in-patients, and out-patients, the sensitivity patterns of strains found in these various groups of people were in some cases markedly different. The hospital staff, although exposed to a hospital environment for a long period of time, failed to harbour the highly resistant strains. True, they carried the highest percentage resistant to penicillin, but resistance of their strains to other agents was relatively low.

TABLE VI.

Source	No. of carriers	Phage group 1	2	3	M	"Mixed"
Symptomless nasal carriers on hospital staff	129	22 (17%)	38 (29%)	22 (17%)	15 (12%)	18 (14%)
In-patients	59	11 (19%)	8 (14%)	15 (25%)	15 (25%)	8 (14%)

Unlike the hospital staff, in-patients had been exposed to hospital environment for a relatively short period, yet their strains possessed a much higher degree of resistance.

Phage typing results also reveal quite a difference in the strains carried by hospital workers as compared to those carried by in-patients. Table VI shows the phage groups found in these two classes of carriers.

As will be noted in Table VI, hospital staff carried a much higher percentage of Group II strains than did the in-patients. Strains of this group, regardless of source, were found to be quite sensitive (Table VIII). In-patients, on the other hand, carried a much higher percentage of Group III and Miscellaneous strains. These two groups were found to contain not only the most resistant strains, but strains responsible for the majority of infections. With such a high proportion of in-patients carrying resistant strains, not unlike in phage pattern those responsible for many infections, one may do well to consider the possibility of auto-infection. From these findings it would appear that, in our study at least, the strains being carried in the anterior nares of in-patients are far more significant than those carried by the hospital staff.

A study of antibiotic sensitivity patterns and phage patterns indicated that strains isolated from the hospital air were more closely related to strains carried by in-patients than to those carried by the hospital staff. Likewise, hospital air strains were found to be similar to those generally responsible for staphylococcal infections.

Bynoe[12] in a personal communication stated that, in Canada, phage type 81 staphylococcus is one of the commonest "hospital" strains found; it is frequently involved in hospital infections and is usually resistant to a number of antibiotics. In this study, 131 of our strains, constituting over 31% of the typable staphylococci, were lysed by phage 81. Table VII shows the distribution of this type as related to source.

TABLE VII.

Source	No. carrying Staph. pyogenes aureus	No. lysed by phage type 81
Doctors and graduate nurses	39	13 (33%)
Student nurses	50	8 (16%)
Nursing assistants	40	6 (15%)
In-patients	59	22 (37%)
Cases with *Staph.* infection	56	28 (50%)
Out-patients	55	12 (22%)
Hospital air (exposed plates)	141 (strains)	42 (30%)

Leaving out "depots", we may conclude from the figures shown in Table VII that, in this hospital, in-patients, doctors and graduate nurses, and hospital air—in that order—are the greatest sources of the so-called "Canadian hospital" strain, namely phage type 81 staphylococci. Strains of this type are apparently not carried to any great extent by student nurses and nursing assistants. Likewise, a low percentage of the isolations from out-patients were lysed by phage type 81.

Strains lysed by phage type 81 were quite resistant. Of the 131 lysed by phage type 81, 89 were resistant to two or more antibiotics, and 62 possessed resistance to as many as three or more of the antibiotics used.

Strains belonging within phage Group II, regardless of source, were generally quite sensitive

TABLE VIII.—RESISTANCE OF STRAINS FOUND IN VARIOUS PHAGE GROUPS

Phage group	No. of strains	Resistant to: 0*	1*	2*	3*	4*	5*
Group I	67	11	30	15	—	12	1
Group II	89	22	60	7	—	—	—
Group III	89	17	11	11	13	36	1
Group M	95	11	20	17	40	7	—
Mixed I/M	32	7	5	3	16	1	—
Mixed III/M	32	2	14	16	—	—	—
Mixed	7	4	3	—	—	—	—
Non-typable	27	13	10	2	—	2	—

*Number of antibiotics.

(see Table VIII). Only seven strains out of 89 were resistant to two antibiotics. Alder *et al.*[16] reported similar findings when studying antibiotic-resistant staphylococci.

Table VIII also reveals that the most resistant strains isolated, regardless of source, were always lysed by phages of Groups I, III, or M. This finding is also in keeping with that of Alder and his co-workers who reported that most of their resistant strains belonged to phage groups I and III.

SUMMARY

A survey was made in a general hospital to determine the prevalence, phage type, and antibiotic resistance pattern of *Staphylococcus pyogenes aureus* in staff, patients, and hospital air. Altogether 440 coagulase-positive staphylococci were isolated. They consisted of 243 strains from symptomless nasal carriers, 141 strains from hospital air, and 56 strains from cases of staphylococcal infection within the hospital. All 440 strains isolated were bacteriophage typed and tested for sensitivity to six commonly employed antibiotics.

Nasal carrier rates were determined for five different groups: staff doctors and graduate nurses, student nurses, nursing assistants, in-patients and out-patients. Approximately 50% within each group were found to be carrying coagulase-positive staphylococci in their anterior nares.

First-year student nurses entering training without ward exposure were found to have a carrier rate of 43%. This was lower than the rate in second- and third-year student nurses, who possessed 52% and 53% carrier rates respectively.

Fifty-six cases of staphylococcal infection were diagnosed within the hospital during the nine-months' period of this investigation. Patients' charts revealed that 36 of the 56 cases were "admitted" to hospital with their infection, while 20 of the infections were classified as "institutional". Results showed a marked difference in the strains isolated from "admitted" cases as compared with those isolated from "institutional" infections. "Admitted" strains showed a rather low degree of antibiotic resistance, and indeed one-third were sensitive to all six antibiotics employed. "Institutional" strains were all resistant to one or more antibiotics, 65% possessing resistance to three or more of the six antibiotics used.

The most resistant strains of coagulase-positive staphylococci found within the hospital were those isolated from the anterior nares of in-patients. In this group 80% of the strains isolated were resistant to penicillin; 42% to streptomycin; 46% to terramycin; 44% to aureomycin; and 2% to erythromycin.

Strains isolated from the hospital air also possessed a high degree of resistance. Of these, 77% were resistant to penicillin; 48% to streptomycin; 42% to terramycin; 30% to aureomycin; and 3% to chloramphenicol.

Although 89% of the strains isolated from symptomless nasal carriers on the hospital staff were resistant to penicillin, resistance of these strains to the five other antibiotic agents was relatively low.

Phage typing results showed that strains of phage group II, regardless of source, were generally quite sensitive. In contrast, the strains possessing marked resistance were lysed by phages belonging to Groups I, III, and Miscellaneous.

The "Canadian hospital" strain lysed by phage type 81 was found to be well represented in cases of infection. It was carried by a high percentage of in-patients as well as by a high percentage of doctors and nurses, and was also common among isolations made from the hospital air. Only a low percentage of student nurses and nursing assistants carried type 81 strain.

Grateful acknowledgment is made to Mr. R. D. Comtois of the staff of the Laboratory of Hygiene, Ottawa, for his valuable assistance in accomplishing the phage typing of the 440 strains of *Staphylococcus pyogenes aureus* isolated during this survey.

REFERENCES

1. BLOWERS, R. *et al.*: *Lancet*, **2**: 786. 1955.
2. BRODIE, J., JAMIESON, W. AND SOMMERVILLE, T.: *Ibid.*, **2**: 233, 1955.
3. BARBER, M. AND BURSTON, J.: *Ibid.*, **2**: 578, 1955.
4. MURRAY, J. AND CALMAN, R. M.: *Brit. M. J.*, **1**: 81, 1955.
5. COLEBROOK, L.: *Lancet*, **2**: 885, 1955.
6. STARKEY, H.: *Canad. M. A. J.*, **75**: 371, 1956.
7. CHAPMAN, G. H.: *J. Bact.*, **50**: 201, 1945.
8. MAITLAND, H. B. AND MARTYN, G.: *J. Path. & Bact.*, **60**: 553, 1948.
9. STOKES, E. J.: Clinical bacteriology, Edward Arnold & Co., London, 1955, p. 78.
10. MACKIE, T. J. AND MCCARTNEY, J. E.: Handbook of practical bacteriology, 9th ed., E. & S. Livingstone Ltd., Edinburgh, 1953, p. 330.
11. BYNOE, E. T.: Personal communication, 1956.
12. *Idem*: Personal communication, 1955.
13. MILES, A. A., WILLIAMS, R. E. O. AND CLAYTON-COOPER, B.: *J. Path. & Bact.*, **56**: 513, 1944.
14. EDMUNDS, P. N., *et al.*: *Brit. M J.*, **1**: 990, 1955.
15. BRODIE, J., SOMMERVILLE, T. AND WILSON, S. G. F.: *Ibid.*, **1**: 667, 1956.
16. ALDER, V. G., GILLESPIE, W. A. AND THOMPSON, M. E. M.: *J. Path. & Bact.*, **70**: 503, 1955.
17. WILLIAMS, R. E. O., Chairman: Report of the Subcommittee on Bacteriophage Typing of Staphylococci, The International Association of Microbiologists, April 1955.
18. WILLIAMS, R. E. O. AND RIPPON, J. E.: *J. Hyg.*, **50**: 320, 1952.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

TONSILLECTOMY AND THE RISK OF POLIOMYELITIS*

PERCY BARSKY, M.D. and
RONALD LAUER, M.D., *Winnipeg, Man.*

DURING 1953, Manitoba, together with the other Prairie Provinces and the northwestern United States, experienced a severe outbreak of poliomyelitis. A total of 2371 cases was reported to the Manitoba Department of Health and Public Welfare at this time. The epidemic was unique in this locality because of the high incidence and severity of the forms of bulbar poliomyelitis. The present report is an analysis of the incidence of tonsillectomy among these patients.

Several investigators[1-4] have indicated that there is a higher incidence of tonsillectomy among patients who develop bulbar poliomyelitis than among those who manifest other forms of the disease. The present enquiry differs from previous ones in that the incidence of tonsillectomy in the various forms of poliomyelitis has been correlated with the incidence among an exposed control population in whom the disease did not develop.

TERMINOLOGY

Paralytic poliomyelitis—an acute febrile illness with signs of central nervous system involvement and demonstrated loss of muscle power due to muscle paralysis.

Bulbar poliomyelitis—involvement of cranial nerve nuclei or vital centres in the brain stem.

Spinal poliomyelitis—paralytic cases exclusive of bulbar or bulbo-spinal.

Bulbo-spinal poliomyelitis—combined type of the above two.

Non-paralytic poliomyelitis—an acute febrile illness with central nervous system signs, including muscle stiffness and abnormal cerebrospinal fluid findings.

Household contact controls—referring to the personal association between a poliomyelitis case and another person in the home at any time in the week surrounding the date of onset.

Tonsillectomy—surgical removal of the palatine tonsils with or without excision of the adenoids.

METHOD

Records of all the reported cases during the 1953 outbreak were supplied by the Manitoba Department of Health and Public Welfare. With this as a basis, a form letter and questionnaire were sent to each patient or to the head of his household. This questionnaire was in two sections. Section A referred to the patient, and Section B referred to his household contacts. The specific question was asked whether the patient or his household contact had had a tonsillectomy, and if so, the approximate date

TABLE I.—ANALYSIS OF CASES OF POLIOMYELITIS BY AGE AND TYPE

	Bulbar poliomyelitis	*Bulbo-spinal poliomyelitis*	*Spinal poliomyelitis*	*Non-paralytic poliomyelitis*	*All forms (totals)*
0 to 4 years					
No. of cases with poliomyelitis	19	20	133	73	245
No. of controls	72	69	384	181	706
5 to 9 years					
No. of cases with poliomyelitis	39	34	112	117	302
No. of controls	62	85	323	222	692
10 to 14 years					
No. of cases with poliomyelitis	18	15	45	71	149
No. of controls	46	48	170	138	402
15 to 19 years					
No. of cases with poliomyelitis	2	9	37	37	85
No. of controls	15	11	104	105	235
20 and over					
No. of cases with poliomyelitis	23	53	210	103	389
No. of controls	208	184	874	610	1876
All ages					
No. of cases with poliomyelitis	101	131	537	401	1170
No. of controls	403	397	1855	1256	3911

*This survey was aided by a grant from the Department of National Health and Welfare, Ottawa.

From the Department of Pædiatrics, Manitoba Medical College and Children's Hospital of Winnipeg.

TABLE II.—ASSOCIATION OF TONSILLECTOMY (T. & A.) AND POLIOMYELITIS

	Bulbar poliomyelitis	*Bulbo-spinal poliomyelitis*	*Spinal poliomyelitis*	*Non-paralytic poliomyelitis*	*All forms of poliomyelitis*
0 to 4 years					
% T. & A. with poliomyelitis	10.5	15.0	8.4	15.1	11.7
% T. & A. in controls	5.5	1.4	4.7	4.9	4.6
5 to 9 years					
% T. & A. with poliomyelitis	82.0	76.5	50.0	30.0	60.1
% T. & A. in controls	48.3	35.2	26.4	28.2	30.0
10 to 14 years					
% T. & A. with poliomyelitis	77.7	92.3	46.8	52.1	58.0
% T. & A. in controls	60.8	60.1	40.0	50.8	48.4
15 to 19 years					
% T. & A. with poliomyelitis		55.5	43.8	56.8	50.7
% T. & A. in controls	66.0	54.6	38.8	42.9	41.1
20 years and over					
% T. & A. with poliomyelitis	78.2	67.9	61.9	49.5	60.1
% T. & A. in controls	51.4	49.2	42.6	38.5	42.5
All ages					
% T. & A. with poliomyelitis	67.3	64.1	43.5	42.6	47.6
% T. & A. in controls	44.4	46.3	34.4	29.7	28.7

of operation. Other specific questions relating to injury, inoculation and infection were also asked, and the results will be reported in a later paper. The cases of poliomyelitis were divided into their various types on the basis of the case-record histories supplied by the Department.

RESULTS

Of 2350 questionnaires sent out, 1170 were returned sufficiently complete to be included in this series; in addition, there were 3911 household contact controls. Table I summarizes all the cases of poliomyelitis and their household contact controls in the six age groups. It will be seen that 19.8% of the cases in the study group were bulbar and bulbo-spinal, and that 33% of all the cases of poliomyelitis and 32% of the bulbar and bulbo-spinal cases occurred in those 20 years and over.

Table II shows the association of tonsillectomy and poliomyelitis, according to type, as compared with the incidence of tonsillectomy in the household contact controls. It is noted that, for all age groups, 67.3% of the bulbar group gave a history of tonsillectomy as contrasted with 44.4% of the household contact controls. The bulbo-spinal group showed an incidence of 64.1% as compared to 46.3% of the controls. This surgical procedure had been done in 43.5% of the spinal cases and in only 34.4% of their household contact controls; 42.6% of the non-paralytic cases had this procedure performed as compared with 29.7% of their controls. In the

TABLE III.

Clinical form developed in those affected	*Bulbar poliomyelitis*	*Bulbo-spinal poliomyelitis*	*Spinal poliomyelitis*	*Non-paralytic poliomyelitis*	*All clinical forms*
Total number exposed to poliomyelitis	504	528	2392	1657	5081
Number developing disease					
Number	101	131	537	410	1170
% of exposed population	20%	24%	23%	32%	23%
% T. & A. in entire exposed group	49%	45%	24%	33%	30%
% T. & A. in those developing poliomyelitis	67%	64%	43%	42%	48%
% T. & A. in those not developing disease	44%	46%	34%	30%	29%
% poliomyelitis with T. & A.					
% controls with T. & A.					

The results in the foregoing tables have undergone analyses by the Research and Statistics Division of the Department of National Health and Welfare, and in accordance with Chi-Square values the differences are statistically significant.

age group 5 to 14 years there appears to be a high incidence of tonsillectomy with poliomyelitis. In the other age groups this is not relatively great, and the over-all incidence shows no significant trend. In all age groups there is a higher incidence of tonsillectomies among the controls in the households of the bulbar and bulbo-spinal groups than among other groups. Table II illustrates that generally there is a 20% greater incidence of tonsillectomy in those contracting all forms of poliomyelitis than in the total control population. The incidence in the bulbar group was 20% higher than in its controls.

The greater degree of infectivity of non-paralytic poliomyelitis is indicated in Table III, which shows that 32% of the exposed population contracted this type of the disease.

CONCLUSION

1. It was observed that persons with bulbar and bulbo-spinal poliomyelitis are more likely to have had their tonsils removed than those with the spinal or non-paralytic forms. The family contact controls of bulbar and bulbo-spinal types are also more likely to have had tonsillectomy than the family contacts of the other groups. This suggests that there may be some underlying factor which determines both tonsillectomy and bulbar infection.

2. There is a greater incidence of tonsillectomy *in all forms of poliomyelitis* than in the family controls who do not develop the disease. When these cases are compared with the population exposed to poliomyelitis but not developing the disease, it will be seen that there is a similar increase in the incidence of tonsillectomy among these controls. There may be some local condition of the pharynx which on the one hand is an indication for tonsillectomy and on the other hand makes a child more liable to bulbar poliomyelitis after the operation.

The authors are indebted to the late Dr. Maxwell Bowman, Director, Preventive Medical Services, Department of Health and Public Welfare, Province of Manitoba, and to Dr. E. H. Lossing, Chief, Epidemiology Division, Department of National Health and Welfare, Ottawa. Gratitude is also expressed to C. Walker of the Research and Statistics Division, Department of National Health and Welfare, Ottawa, who analyzed the statistical data, and to Miss S. Vinsky for her invaluable help with the stenographic and clerical work associated with the preparation of this publication.

REFERENCES

1. ANDERSON, G. W. AND RONDEAU, J. L.: *J. A. M. A.*, **155**: 1123, 1954.
2. TOP, F. H. AND VAUGHAN, H. F.: *Am. J. Pub. Health.*, **31**: 777, 1941.
3. LUCCHESI, P. F. AND LA BOCCETTA, A. C.: *Am. J. Dis. Child.*, **68**: 1, 1944.
4. SOUTHCOTT, R. V.: *M. J. Australia*, **2**: 281, 1953.
5. LACEY, B. W.: *Lancet*, **1**: 849, 1949.

Percy Barsky: 1471 Main St., Winnipeg, Man.
Ronald Lauer: Children's Hospital, Buffalo, N.Y.

RÉSUMÉ

Au cours d'une enquête basée sur les réponses à un questionnaire envoyé à 1,170 exemplaires, on a trouvé que les malades ayant souffert de paralysie bulbaire ou bulbo-médullaire étaient passés en plus grand nombre par l'amygdalectomie que les autres n'ayant eu que la forme spinale ou les formes non paralytiques. La même remarque s'applique aux membres des familles de ceux là. Il semblerait y avoir un facteur commun qui prédisposerait à la fois à l'amygdalite et à l'atteinte bulbaire. On a également trouvé que l'amygdalectomie avait été pratiquée chez un plus grand nombre de malades ayant eu la poliomyélite sous n'importe quelle forme que chez les témoins de la population en général.

THE SALIVARY SECRETION OF IODIDE IN HYPOTHYROIDISM*

MARION H. FERGUSON,
A. NAIMARK† and J. A. HILDES,
Winnipeg

SIMILARITIES BETWEEN the salivary secretion of iodide and the thyroid trapping mechanism for this ion have been demonstrated by a number of investigators: both glands are able to concentrate iodide to a comparable degree,[1-3] and this ability is depressed in both by the administration of perchlorate, thiocyanate and nitrate;[3-7] in addition, Fawcett and Kirkwood[8, 9] have reported the presence in salivary glands of enzymes involved in the organic binding of iodine.

Based on this concept and on the study of a large number of patients, Thode *et al.*[10, 11] have proposed that the salivary radioactivity 24 hours after a tracer dose of I^{131}, coupled with the protein bound iodine^{131}, is a useful diagnostic

*From the Department of Physiology and Medical Research, University of Manitoba. This work was aided by a grant from the National Research Council of Canada.
†Scholar of the Manitoba Institute for the Advancement of Medical Education and Research.

test for abnormal thyroid states, especially hypothyroidism. In that condition they found salivary activity to be high while in hyperthyroidism it was low. On the other hand, Gerbaulet and Fitting[12] found the opposite in that salivary iodide excretion was high in hyperthyroidism. Fellinger *et al.*[13] and Gabrielsen and Kretchmar[14] reported that salivary iodide clearance was independent of thyroid function.

The reports quoted above deal with mixed saliva. Honour *et al.*[15] reported a difference between various salivary glands in their ability to concentrate iodide. Furthermore, both the rate of secretion and the blood level of iodide are important factors in the salivary concentration of iodide.[7] Such results and the results reported here emphasize the necessity of taking all these factors into account if the iodide content of saliva from different persons is to be compared. In the present study of the effect of hypothyroidism on the salivary glands an attempt has been made to eliminate these variables.

METHODS AND MATERIALS

Subjects

Twelve euthyroid and five hypothyroid subjects were studied. The euthyroids, six males and six females, ranged in age from 25 to 60 years. This group was made up of healthy, laboratory workers and patients convalescing from diseases not related to salivary or thyroid glands or the kidney.[16] The five hypothyroid subjects are listed in Table I with the results of thyroid function studies.

TABLE I.—SUMMARY OF HYPOTHYROID SUBJECTS

			Thyroid Function Tests		
Subject	*Sex*	*Age*	*24 hr. uptake I^{131}% of dose*	*P.B.I. μg%*	*B.M.R. %*
W.P.	M	65	5	1.0	−17
F.G.	F	53	2	2.9	−19
C.C.	M	64	9	—	−26
S.G.	F	42	4	2.4	−37
A.R.	M	36	7	1.3	−36

Experimental Methods

In four subjects simultaneous collections were made from individual parotid glands, using collecting cups as previously described,[7] and the mixed saliva of the submaxillary and sublingual glands was collected from the floor of the mouth by a dental suction. In the remaining tests parotid secretion only was collected. Salivary secretion was stimulated by the subcutaneous injection of 5-10 mg. of methacholine chloride (mecholyl chloride Merck) or by dilute acetic acid applied to the tongue. At the beginning of the experimental period, doses of 20 to 100 μc of carrier-free radioiodine were administered. After intravenous administration, a period of 30 minutes was allowed for equilibration before collections were made; after oral administration a two-hour period was allowed to permit absorption. The collection of saliva and serial blood samples was then carried out over the subsequent one to two hours.

The radioactivity of the saliva and serum samples was measured using a well-type scintillation counter. It was assumed that the serum radioactivity for the first four or five hours after the administration of I^{131} was derived entirely from free radio-iodide, provided the subject had not received a dose of I^{131} within the previous few days. It has been shown that there are negligible amounts of protein bound radioactivity in saliva.[15, 17] Therefore, protein precipitation was not carried out before counting.

There is a latent period of one to two minutes after a subcutaneous mecholyl injection followed by a sudden profuse flow of saliva. The sample collected during the first minute of the flow usually had a much higher iodide content than subsequent samples of the same flow rate. We have considered this an artefact due to the duct and collecting system dead space and have discarded these from the results.

A comparison of the iodide content of parotid saliva stimulated by mecholyl and that stimulated by acetic acid showed no difference between them.

As the salivary iodide is dependent on blood level of iodide, the results have been expressed as the ratio of salivary concentration of iodide to the serum concentration.

RESULTS

Parotid vs. Submaxillary and Sublingual

Results of one of the tests are shown in Fig 1. Both parotid and mixed saliva iodide show a curvilinear negative relationship to flow rate. The iodide concentrations in saliva from both sources are similar at high rates of flow but not at low rates. Similar results were obtained in two of the other subjects studied in this way. However, in the remaining one the iodide concentration in the mixed saliva remained higher than that in parotid juice at all flow rates.

Parotid Secretion in Normals and Hypothyroids

Fig. 2 shows the individually plotted results of seven of the 12 euthyroid subjects. The remaining five are omitted from the graph for clarity. Although there is a fairly wide scatter between the subjects, it can be seen that the data conform to the general negative curved relationship shown elsewhere,[7] although two of the subjects represented here do not have very high S/S ratios at low secretion rates.

Fig. 3 shows the results of each of the five hypothyroid subjects plotted in the same way as the normals. Again there is a scatter between the subjects, but the curves for four of the subjects

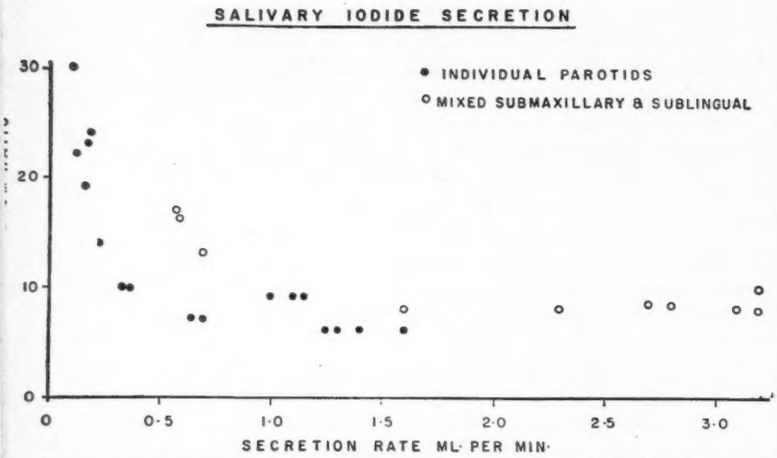


Fig. 1.—The results of simultaneous collections from individual parotid glands (closed circles) and mixed submaxillary and sublingual saliva (open circles).

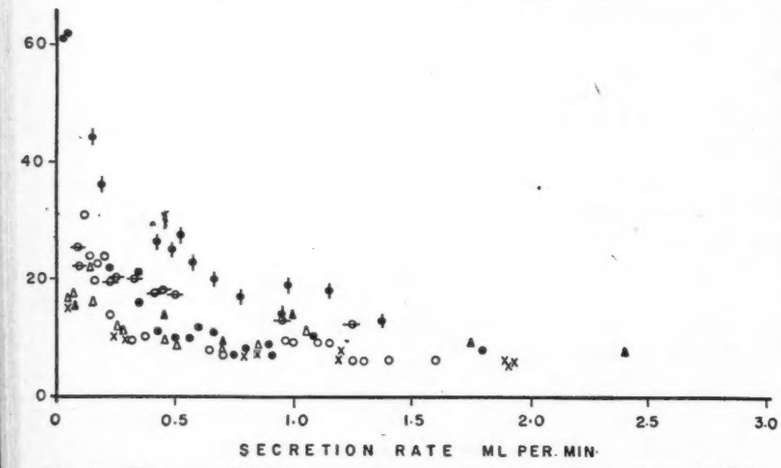


Fig. 2.—The parotid iodide secretion of euthyroid subjects shown individually. Only 7 of the 12 have been shown for clarity.

conform to the negative relationship described for normals. The one represented by the closed circles has approximately the same ratio at all secretion rates.

Fig. 4 shows the 12 euthyroid and five hypothyroid subjects plotted together. Although the highest points are hypothyroid subjects and the lowest are euthyroids, it may be seen that there is no real difference between the sets of data.

DISCUSSION

The present results indicate that there is no difference in the concentrating ability of the parotid glands for iodide in hypothyroid subjects compared to normal. This is in agreement with the conclusions of Fellinger *et al.*[13] and Gabrielsen and Kretchmar,[14] and does not support the concepts expressed by Thode and his colleagues.[8-11] Possible explanations of these differences lie in the rate of secretion, in the blood level of iodide and in the use of mixed saliva.

The dependence of iodide concentration on secretion rate, which has been shown to hold for both parotid and mixed submaxillary and sublingual glands, would tend to give the salivary results found by Thode if the rate of salivary secretion were reduced in hypothyroids. It is difficult to compare rates of secretion between the groups, as subjects vary widely in their response to the stimuli used.

As the concentration of iodide in the saliva is dependent on the inorganic iodide level of the blood, the thyroid state of the subject will influence the salivary radioactivity 24 hours after a tracer dose in the direction of the change found by Thode *et al.*[10, 11] However, this factor is obviated by expressing the results as salivary/serum ratios.

With regard to the use of mixed saliva, although both parotid and mixed submaxillary and sublingual saliva are similarly dependent on secretion rate, as shown in Fig. 1, if the data in our simultaneously collected unstimulated saliva are expressed as a ratio of parotid to mixed saliva, the results are similar to those of Honour *et al.*[15] This is shown in Table II. It

TABLE II.—RATIO OF CONCENTRATION OF IODIDE IN PAROTID TO THAT OF MIXED SALIVA DURING SIMULTANEOUS COLLECTIONS

Honour, Myant and Rowlands		*Present series*	
Subject	*Ratio*	*Subject*	*Ratio*
19	4.4	1	1.6
20	6.4	2(a)	0.8
21	1.1	(b)	0.6
22	1.8	3(a)	2.7
23	1.5	(b)	2.0
24	2.3	4	0.9
25	1.9	5	1.0
26	2.5		
27	2.3		

would seem that these results are not necessarily caused by the inability of the submaxillary and sublingual glands to concentrate iodide, as was concluded by these authors, but by the differences in secretion rate between the various glands at any time. Furthermore, it has been shown by Schneyer and Levin[18] that the relative secretion rates of the different glands vary with stimulation. The use of mixed saliva may, therefore, give fallacious results in assessing the iodide concentrating ability of the salivary glands.

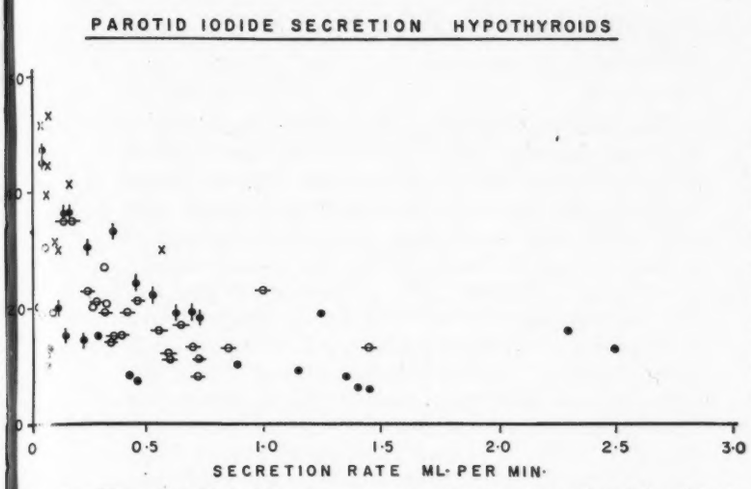


Fig. 3.—The parotid iodide secretion in the five hypothyroid subjects shown individually.

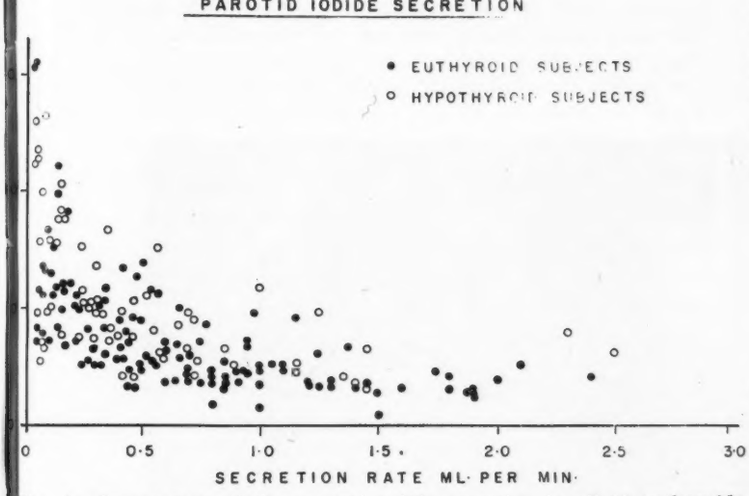


Fig. 4.—Comparison of the parotid iodide secretion in all 12 euthyroids (closed circles) and 5 hypothyroids (open circles).

SUMMARY

1. The ability of the salivary glands to concentrate and secrete iodide was tested in 12 euthyroid and five hypothyroid subjects.

2. Experiments in which parotid juice was compared with simultaneously collected saliva from the submaxillary and sublingual glands indicated large and inconsistent differences between these two sources of saliva.

3. No difference was found between the secretion of iodide by the parotid glands of euthyroid and hypothyroid subjects.

The technical assistance of Miss K. Rasmussen and Mrs. Eleanor Thomas is gratefully acknowledged.

REFERENCES

1. VANDERLAAN, J. E. AND VANDERLAAN, W. P.: *Endocrinology*, 40: 403, 1947.
2. MYANT, N. B. *et al.*: *Clin. Sc.*, 9: 405, 1950.
3. FREINKEL, N. AND INGBAR, S. H.: *J. Clin. Invest.* 32: 1077, 1953.
4. WYNGAARDEN, J. B. WRIGHT, B. M. AND WAYS, P.: *Endocrinology*, 50: 537, 1952.
5. ROWLANDS, E. N., EDWARDS, D. A. W. AND HONOUR, A. J.: *Clin. Sc.*, 12: 399, 1953.
6. EDWARDS, D. A. W., FLETCHER, K. AND ROWLANDS, E. N.: *Lancet*, 1: 498, 1954.
7. FERGUSON, M. H., NAIMARK, A. AND HILDES, J. A.: *Canad. J. Biochem. & Physiol.*, 34: 683, 1956.
8. FAWCETT, D. M. AND KIRKWOOD, S.: *Science*, 120: 547, 1954.
9. *Idem*: *J. Biol. Chem.*, 205: 795, 1953.
10. THODE, H. G., JAIMET, C. H. AND KIRKWOOD, S.: *New England J. Med.*, 251: 129, 1954.
11. JAIMET, C. H. AND THODE, H. G.: *Canad. M. A. J.*, 74: 865, 1956.
12. GERBAULET, K. AND FITTING, W.: *Klin. Wchnschr.*, 34: 120, 1956.
13. FELLINGER, K., HÖFER, R. AND VETTER, H.: *J. Clin. Endocrinol.*, 16: 449, 1956.
14. GABRIELSEN, Z. AND KRETCHMAR, A. L.: *Ibid.*, 16: 1347, 1956.
15. HONOUR, A. J., MYANT, N. B. AND ROWLANDS, E. N.: *Clin. Sc.*, 11: 447, 1952.
16. RIGGS, D. S.: *Pharmacol. Rev.*, 4: 284, 1952.
17. FREINKEL, N. AND INGBAR, S. H.: *New England J. Med.*, 252: 125, 1955.
18. SCHNEYER, L. H. AND LEVIN, L. K.: *J. Appl. Physiol.*, 7: 609, 1955.

RÉSUMÉ

La capacité des glandes salivaires à concentrer et à sécréter l'iodure a été vérifiée chez 12 sujets dont la fonction thyroïdienne était normale et chez 5 hypothyroïdiens. Les expériences dans lesquelles la salive des glandes parotides et celle des glandes sous-maxillaires et sublinguales ont été recueillies simultanément montrent qu'il existe une divergence prononcée et incompatible entre ces deux sources de sécrétion. On n'a pu établir aucune différence dans la sécrétion d'iodure de la parotide dans l'euthyroïdie et dans l'hypothyroïdie.

DIFFUSE INTERSTITIAL PULMONARY FIBROSIS (HAMMAN-RICH SYNDROME)

Until the present case reported by Van Slyck (*Dis. Chest*, 31: 593, 1957) there were only five instances in which an ante-mortem diagnosis of the Hamman-Rich syndrome had been reported. Lung biopsy was the crucial procedure in each case, as it was here. Several other cases have been suspected during life on clinical grounds without microscopic corroboration.

With the exception of one case previously reported, treatment of any kind has been uniformly unsuccessful. Reports suggest that cases treated early in their course with steroids may show temporary improvement, but that this is followed by rapid fatal exacerbations upon reducing the dose below a critical level. Other cases treated late in their course have either not improved or apparently gone downhill more rapidly.

A case was reported in 1956 in which diagnosis was established early by lung biopsy, and subsequent treatment with corticosteroids resulted in a remarkable remission of signs and symptoms which persisted 17 months (at which time the case was reported). The daily maintenance dose of cortisone was 40 milligrams. The present case parallels the 1956 one closely in many respects. Although this patient's chest film has shown little or no change, and there are still signs of pulmonary disease present, the clinical improvement is comparable to the earlier. The maintenance dose, 10 milligrams of prednisone, corresponds to 40 milligrams of cortisone used to maintain the other patient.

These cases apparently cast some doubt on the validity of the conclusion reached by previous authors—namely that corticosteroids are contraindicated in treating known or suspected cases of the Hamman-Rich syndrome, and to point up the fact that no hard and fast deductions can be drawn from the meagre clinical material available. The use of lung biopsy early in patients who defy accurate diagnosis by the usual means may result in more cases of the Hamman-Rich syndrome being brought to light, and their subsequent course more intelligently observed.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

Case Reports

MYXOMA OF THE LEFT ATRIUM SIMULATING MITRAL STENOSIS WITH CEREBRAL EMBOLI*

L. HORLICK, M.D., F.R.C.P.[C.] and
J. E. MERRIMAN, M.D., F.R.C.P.[C.],
Saskatoon, Sask.

PRIMARY CARDIAC TUMOURS are very rare. Three-quarters of them are benign and myxomas make up approximately 50% of them. Seventy-five per cent of all myxomas are found in the left atrium, where they may produce obstruction to either the mitral valve or the pulmonary veins with characteristic clinical sequelæ. There have been several excellent recent reviews on the subject.[1-5]

The following case is presented for two reasons: (1) because it presented itself primarily as a neurological problem and this form of presentation is unusual in myxomas of the left atrium; and (2) because of the hæmodynamic data available which indicate the remarkable similarity of this lesion to true mitral stenosis.

The patient, a 46-year-old woman, had enjoyed excellent health, and bore six children without difficulty before the onset of her present illness. In 1950, she first began to complain of some stiffness of the legs on walking and of some numbness in the left leg. In March 1953, there was a sudden episode of weakness and numbness of the first and second fingers of the left hand, which cleared spontaneously in three weeks. In June 1953, while sitting quietly listening to the radio at home, she collapsed but did not become unconscious, and noted weakness of the left side of the face. Subsequently, there was some weakness of grasp with the left hand and numbness of the left foot. Her memory was poor for two to three months thereafter. She recovered completely from this episode, but continued to have transient episodes of blurring of vision which lasted for only a few minutes. In November 1955, while walking along the street, she fell to the ground as though she had stumbled. She did not lose consciousness. She subsequently complained of weakness and numbness in the left side of her body involving the face, left arm and left leg. Four days later, she was seen by her physician, who recorded obvious weakness of the left face and arm, and numbness of the left foot. For three weeks before admission, she had felt weak and unable to keep up with her work. She had lost her appetite and had lost 11 lb. in weight. She had been coughing for two weeks, with greenish sputum streaked with blood. She slept with

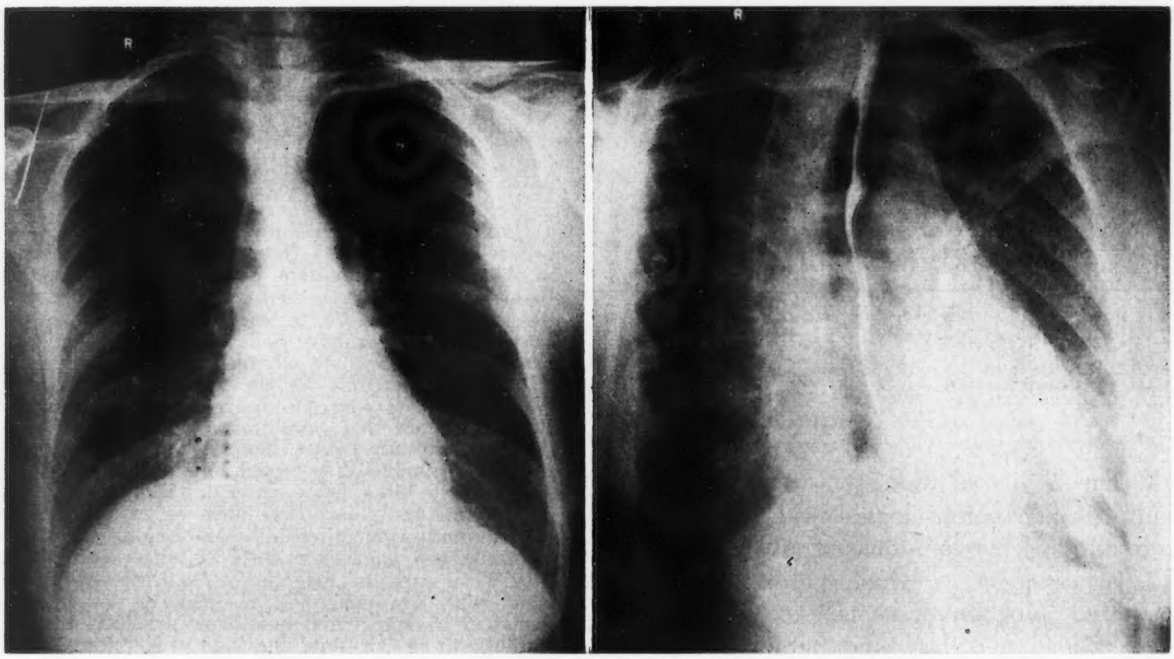


Fig. 1a

Fig. 1b

Fig. 1a.—Roentgenogram in PA position shows the presence of a double contour on the upper right border. **Fig. 1b.**—RAO view with barium in the œsophagus. There is slight posterior displacement of the barium-filled œsophagus by the left atrium.

*From the Department of Medicine, University of Saskatchewan, and the Cardio-pulmonary Laboratory, University of Saskatchewan Hospital, Saskatoon, Saskatchewan, Canada.

two pillows, but was able to lie flat if necessary. There was no history of dyspnœa and no history of peripheral œdema.

She was a well-developed, well-nourished white woman with grey hair, looking considerably older than 46 years. The teeth were carious. The thyroid was enlarged symmetrically. Chest movements were normal. The blood pressure was 100/70 mm. Hg. The radial pulse was 58 per minute and regular, with a small volume. The apex beat was in the fifth intercostal space midway to the anterior axillary line. There was a palpable first heart sound. There were no thrusts or thrills. The heart sounds are shown in Fig. 2. At the apex, there was a loud first sound which was single, with a pre-systolic murmur running into it. There was a grade two (out of four) mid-systolic murmur. The second sound was not loud, but was clearly split and was followed by an opening snap early in diastole. There was then a grade two mid-diastolic murmur which continued into a crescendo pre-systolic murmur. At the pulmonary area, the second sound was accentuated and clearly split. At the tricuspid area, there was a loud split first heart sound, a grade one mid-systolic murmur, a moderately loud split second sound, and a clearly heard opening snap. The abdomen was soft. The liver was palpable two fingers' breadths below the costal margin, and the spleen was not felt. There was no peripheral œdema. The neurological examination was entirely negative, except for decreased finger wiggle on the left hand with slightly impaired joint sense.

The clinical impression was of *rheumatic heart disease* with mitral stenosis, moderate in degree, with a supple valve and embolic phenomena, probably arising from thrombi in the left atrium.

Additional pertinent investigation included the following: (1) Cardiac fluoroscopy revealed clear sulci. There was a mid-hilar congestion. The pulmonary artery was prominent in the postero-anterior (PA) and right anterior oblique (RAO) views, as was the right ventricle. Barium swallow in RAO revealed slight to moderate posterior bowing of the œsophagus by an enlarged left atrium. There was systolic expansion of the left atrium in the PA and RAO views. In the cardiac films, in the PA view a double contour could be seen on the right upper border of the heart (Figs. 1a and 1b). (2) Electrocardiogram revealed a sinus bradycardia with a rate of 47 per minute. Electrical systole was somewhat prolonged, but the record was otherwise within normal limits. (3) Phonocardiogram confirmed the auscultatory findings (Fig. 2). The apical systolic murmur was noted to be very long and was therefore suspicious of some degree of mitral incompetence. (4) Laboratory investigation showed Hb value 81%, white cell count, 5900; differential count—segmented neutrophils 65%, band cells 6%, lymphocytes 26%, monocytes 1%, eosinophils 2%. Sedimentation rate 60 mm. in 1 hr. Blood culture—no growth on three occasions. Urine culture—no growth.

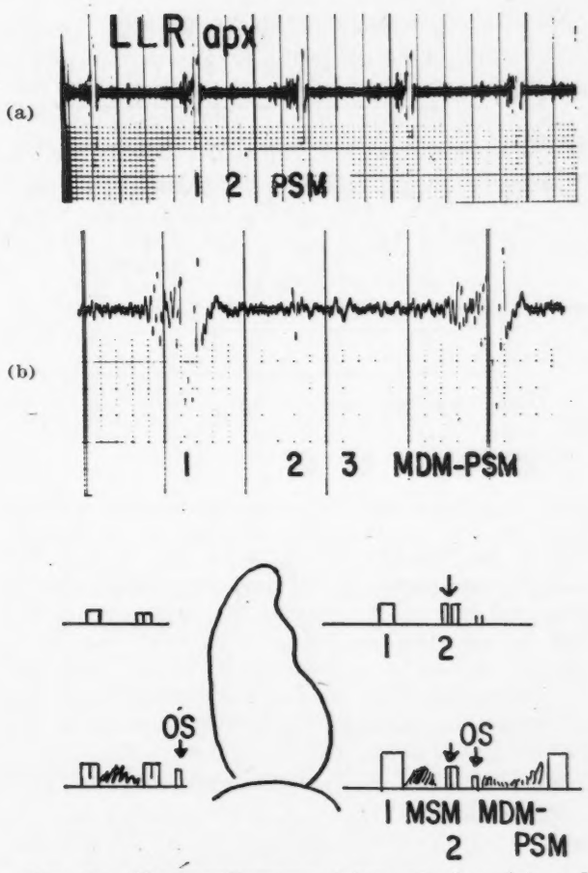


Fig. 2. — Phonocardiograms taken at slow (a) and fast (b) speeds, with the microphone at the apex. Below is the heart sound diagram made by one of the observers (LH) before operation.

Legend: PSM—pre-systolic murmur; MSM—mid-systolic murmur; MDM—mid-diastolic murmur; and OS—opening snap.

The patient was seen by many observers and extensively discussed at cardiac rounds. It was generally agreed that she had a typical mitral stenosis (supported by physical signs, phonocardiograms and radiographs). It was also agreed that the cardiac lesion was mild and not disabling in nature. The bizarre central nervous system symptoms were considered to be due to emboli arising in the left atrium.

The patient was operated upon on December 28, 1955, by Dr. E. M. Nanson. A considerable left pleural effusion was noted. The pulmonary artery was large and tense. The pulmonary veins were large and the right ventricle appeared enlarged. Simultaneous pressures were recorded from the left atrium, left ventricle and pulmonary artery and are shown in Fig. 3. They were characteristic of mitral obstruction as seen in mitral stenosis. The pulmonary artery pressure was 40/18 mm. Hg. The left auricular pressure was 33/10 and the left ventricular pressure 96/0. The left atrium was then explored and the mitral valve was found to be perfectly normal as regards its size. However,

Canad. M. A. J.
Sept. 15, 1957, vol. 77

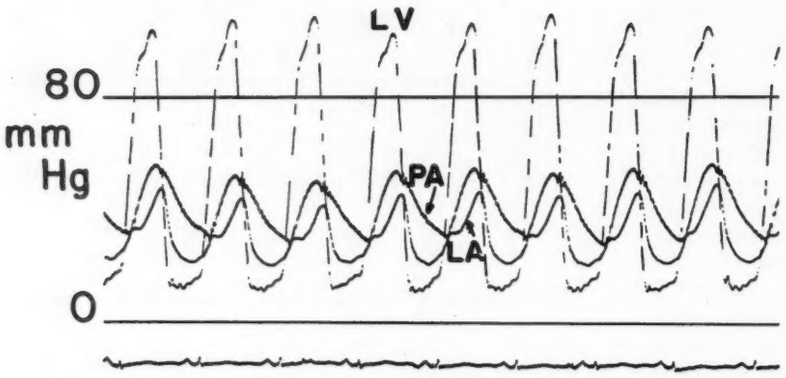


Fig. 3.—Simultaneous pressures recorded at operation with needles in the left ventricle (LV), left auricle (LA) and pulmonary artery (PA). The high V wave in the auricular tracing and the diastolic A-V gradient are characteristic findings in mitral stenosis.

overlying the mitral valve, and attached by a broad base to the interauricular septum, was a tumour which was friable and nodular and which the surgeon estimated at 2½ inches in diameter. It occupied the major portion of the body of the left atrium. During digital exploration, the heart slowed markedly and stopped. It was restarted by manual massage and a satisfactory beat was restored. No attempt was made to remove the tumour. At the end of the operation, the patient was moving all four limbs and the peripheral pulses were normal.

Postoperatively, the patient never regained consciousness completely. She died on the ninth postoperative day. On the day following operation, the pupils were dilated but reacted slightly to light. The eyes were divergent. The head was turned to the left. All the extremities were spastic, and spasticity was more marked on the left. Babinski sign was positive bilaterally. The consulting neurologist, Dr. A. A. Bailey, was of the opinion that decerebrate rigidity was present in moderate degree. The picture was that of upper pons and midbrain involvement, which was probably secondary to an anoxic episode at the time of operation but could be due to an embolus in the basilar artery. She continued to be very restless. Her temperature rose to 103° F. and her breathing was rapid and laboured. Two days before death, she aspirated some tube feeding and developed pneumonia. She also manifested a bizarre disturbance of her serum electrolyte pattern. On the seventh postoperative day, her serum sodium was 172 mEq./litre and chloride 134 mEq./litre. These values rose progressively to 190 mEq./litre of sodium and 155.4 mEq./litre of chloride on the day of death. Urinary excretion of sodium chloride was 4.1 g. in 680 c.c. of urine on January 3, 15.4 g. in 1140 c.c. of urine on January 4, and 1.4 g. in 470 c.c. of urine on January 6.

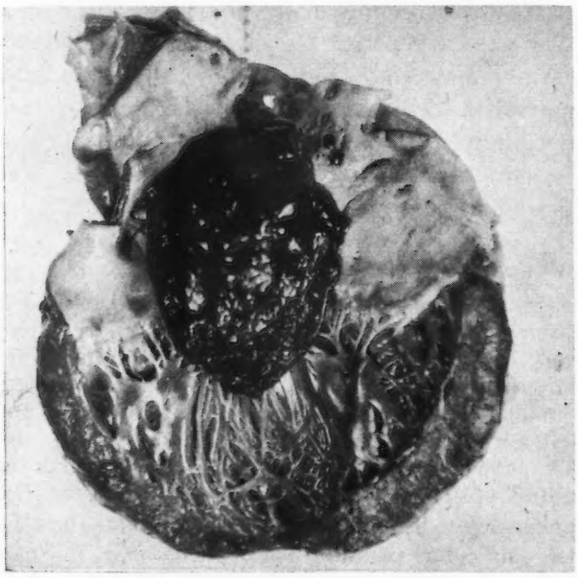


Fig. 4.—The large tumour mass is seen hanging down through a normal mitral valve, and with its apex well into the cavity of the left ventricle. It measured 7.0 cm. in length, 5.0 cm. in antero-posterior diameter and 3.5 cm. from medial to lateral aspect.

PATHOLOGICAL FINDINGS

The heart weighed 360 grams. The mildly dilated left atrium was almost completely filled with a conical mass which measured 7 cm. in length, 5 cm. in antero-posterior diameter, and 3.5 cm. from medial to lateral aspect (Fig. 4). The apex projected downward through the mitral valve, and when it was allowed to hang freely the apex of the lesion extended 3 cm. below the margin of attachment of the mitral cusps. The circumference of the mitral valve ring was 10.5 cm. and the circumference of the lesion at the corresponding level was 8 cm. The tumour was attached to auricular septum by a short pedicle 1 cm. in diameter, located approximately 1 cm. anterior to the closed foramen ovale. Gross evidence of infarction of the brain and kidneys could be seen. A secondary division of the right middle cerebral artery leading to the temporal pole was occluded at a bifurcation. These vessels were distended with firm, greyish-white material which straddled the bifurcation and had extended also into a third small branch. Microscopically, the left auricular tumour was a myxoma which was poorly cellular but moderately vascular. The cells making up the tumour were small with a poorly defined, pale and eosinophilic cytoplasm.

The myocardium exhibited small areas of old infarction. No emboli were seen in the vicinity of these tiny infarcts. Multiple small old infarcts were seen in the kidney. One large arteriole in the corticomedullary junction of the left kidney contained an embolus of tumour cells and stroma. In the brain, a branch of the right middle cerebral, which had been noted to be grossly distended, was found to be plugged with an embolus of tumour similar to that found in the heart. Although most of the

embolus was necrotic and acellular, small viable areas indicated its site of origin. Associated with the emboli, there were several recent cerebral infarcts.

The lungs revealed an acute bronchopneumonia associated with aspirated gastric contents.

DISCUSSION

The diagnosis of left auricular tumour is no longer a sterile intellectual exercise. Crafoord has reported the first successful operation for myxoma of the left atrium, using a by-pass pump and oxygenator.[6] However, the clinical diagnosis is still very difficult to make with any degree of assurance. Classically,[1, 3-5] the salient diagnostic features are said to be the following: (1) the presence of pain, palpitation, œdema and dyspnœa out of proportion to the degree of demonstrable heart disease; the presence of intractable congestive heart failure in the absence of demonstrable valvular lesions; (2) the absence of a previous history of rheumatic fever; (3) marked alteration of the characteristic mitral murmur by a change in position of the body; and (4) extreme respiratory embarrassment from changes in body position. Fainting attacks, loss of consciousness, and the presence of peripheral embolism are also mentioned by some observers, but are not accorded the prominent place given to severe intractable heart disease manifested by congestive heart failure.

The patient gave no history of rheumatic fever, although she did mention a severe illness at the age of 10, and four to five years ago she had some swelling of the metacarpo-phalangeal joint of the right thumb and left middle finger. She had no complaints referable to her heart and the fact that she had successfully sustained six pregnancies made it clear that her heart disease was very mild. However, auscultation revealed a full panoply of murmurs which did not change with position, and cardiac fluoroscopy showed evidence of moderate enlargement of the pulmonary artery, right ventricle and left atrium. It was clearly recognized that the patient's "mitral valvular disease" was of a very mild nature. She was operated on, however, because of recurrent embolism and not because of cardiac failure.

In retrospect, this case demonstrates the remarkable similarity of mitral stenosis and left auricular myxoma, both clinically and hæmodynamically. Currently, the only relatively sure way of distinguishing these two conditions from one another is by angiocardiography, a technique which is not without some hazard for the patient. It is our feeling that atypical cases of mitral stenosis should be carefully scrutinized with a view to excluding auricular myxoma, and that the diagnostic possibilities of angiocardiography should not be ignored.

REFERENCES

1. YATER, W. M.: *Arch. Int. Med.*, 48: 627, 1931.
2. MAHAIM, I.: Les tumeurs et les polypes du cœur; étude anatomo-clinique, Masson & Cie., Paris, 1945.
3. PRICHARD, R. W.: *A.M.A. Arch. Path.*, 51: 98, 1951.
4. GOLDBERG, H. P. AND STEINBERG, I.: *Circulation*, 11: 963, 1955.
5. PAQUET, E.: *Canad. M. A. J.*, 74: 121, 1956.
6. CRAFOORD, C.: Personal communication.

XIPHIDYNIA AS A CONCOMITANT OF ASTHMA*

C. J. MALLOY, M.D., C.M., F.A.C.A., F.A.C.P., F.R.C.P.[C.],† *Montreal*

MICROMETER, microscope and test tube have carried the enquiring mind far beyond the old horizons of medicine. Thus far defying exact measurement and full understanding are the mysterious unions of the universe; atom and molecule, planet and sun, matter and mind. The union of psyche and soma has produced no stranger progeny than xiphidynia or xiphidalgia, first described in the early 18th century.[1]

Pain and tenderness in the xiphoid are commoner than might be expected. Fenz,[2] examining 4000 patients in hospital, found it in 84. This appendage is normally somewhat more sensitive than other cartilaginous or bony structures. When xiphidynia is present, light pressure of the cartilage produces intense pain.

Xiphidynia or xiphidalgia may follow a number of local injuries to the cartilage.[3] The first curative xiphidectomy was performed in 1852 for a xiphoid bent posteriorly, in a patient in whom pain and vomiting occurred spontaneously and could be reproduced by pressure on the xiphoid after eating.[4] Hanlon and Miller[5] report a case of what they called epigastric syndrome in a 40-year-old man with a history of injury to the epigastrium in early life, in whom similar symptoms were found.

---

*From the Departments of Medicine of McGill University and the Royal Victoria Hospital, Montreal.
†Lecturer in Medicine, McGill University, Assistant Physician, Royal Victoria Hospital, Montreal.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

Pain and tenderness in the xiphoid cartilage which is not deformed and has not been injured have been reported in diseases of the cardiovascular system (hypertension and cardiovascular disease) with or without myocardial infarction; gastric ulcer and gastritis, genito-urinary disease, endothoracic goitre, hiatus hernia, obesity, rheumatoid arthritis or osteoarthritis of the cervical spine, and psychoneurosis.[2, 6, 7] Occasionally there is no disease in the xiphoid or elsewhere. In cases of xiphidynia connected with visceral disease, the xiphoid when examined grossly and microscopically has usually been found to be normal; or a true xiphoiditis, presumably secondary to visceral disease, has been found.[6]

The xiphoid or ensiform cartilage stands at the crossroads of the abdomen and the chest; 2 cm. to 6 cm. in length, it consists of cartilage with a core of bone. The latter usually enlarges with age.

It is united to the sternum by a cartilaginous disk which frequently calcifies or ankyloses. It is usually flat and pointed but may be any shape, pliable or rigid, forked or fenestrated. The anterior surface serves as an attachment for part of the rectus abdominis and costo-xiphoid ligament. Posteriorly the fibres of the diaphragm and the transversus thoracis are attached. The aponeurosis of the abdominal muscles finds attachment laterally.

The innervation of the cartilage and joint serves to explain the reference of pain and tenderness here when disease exists in adjoining structures and vice versa. The source of sensory fibres is the 4th to 6th thoracic nerves via the intercostal nerves. Through these may be referred pain from the gastro-intestinal tract and the reverse. Overlapping of the cardiac afferent and xiphoid nerves also occurs, as pain from the heart is transmitted over the 1st to the 6th thoracic nerves. Connections with the ramifications of the phrenic nerve as they spread over the diaphragm and liver capsule explain the frequent reference of xiphoid pain to the shoulder. In view of the foregoing considerations, association of xiphoid pain with bronchial asthma would seem hardly surprising, but it does seem to be a rarity.

CASE 1.—Mrs. S.W., aged 55, had had persistent nasal blockage and mucoid discharge of five or six years' duration when first seen in May 1955. Examination showed evidence of allergic rhinitis; sinus radiographs showed moderate thickening of antral mucosa, especially on the left side. In 1952, a diagnosis of acute anterior infarction was made and for this she was hospitalized for five weeks. After her discharge, there was a gradual onset of pain in the chest and epigastrium on exertion, associated with emotional disturbances. This was occasionally associated with an observed dyspnœa of wheezing type, accompanied by or followed by cough and mucoid sputum. There was never any orthopnœa. She had been obese for many years. Allergy tests showed no significant reactions at any time. Two years after the infarction, the electrocardiogram showed signs of myocardial insufficiency (diphasic T waves in lead 3, QRS slurring in all leads, low voltage T waves in AVL, AVF and V6). Blood pressure had always been normal, except at the time of infarction. The heart was not enlarged at any time to percussion or by fluoroscopy. Radiographs of the gall-bladder and the upper gastro-intestinal tract were normal. Blood sugar levels were normal. There was no evidence of hiatus hernia or spinal arthritis. Respiratory function tests in 1955, when dyspnœa and pain were occurring frequently, showed a vital capacity of one-third of expected normal. There was a marked reduction of minute breathing capacity. At about this time, she was first noted to be markedly tender over the xiphoid cartilage and the xiphisternal junction. When pressure was applied here, she experienced pain transiently, and very rarely an attack of wheezing dyspnœa appeared to be produced by this manœuvre. Adrenalin (epinephrine) had been given at times with relief of the dyspnœa. Nitrites of several types had been used but without effect on the symptoms. Demerol by mouth or by injection was moderately effective. Application of ethyl chloride spray locally and injection of procaine into the tissues adjoining the xiphisternal junction abolished distress and tenderness temporarily, but were not effective in preventing future induced or spontaneous pain and tenderness.

Past history was non-contributory. One daughter had a cough of allergic origin; one son was well so far as is known. The home was a strife-torn unhappy one, reputedly due to the husband's hostile attitude to the patient and daughter. Psychoneurotic factors seemed of paramount importance as contributory causes in symptom production.

CASE 2.—Mr. T.T., aged 47 years, had a four-year history of bronchial asthma and of pain in the lumbar region. Previously he had been in excellent health. Soon after his arrival in Canada from his native Roumania, where he had been a cavalry officer, he began to develop attacks of typical bronchial asthma, especially in summer. He was found to be allergic to common grasses, dust, alternaria and a number of foods. Nasal symptoms were always at a minimum. With desensitization for grasses, dust and alternaria, symptoms were

very mild in 1955 and practically absent in 1956. Radiographs of the chest and sinuses showed no noteworthy abnormality, but a subluxated intervertebral disk in the lumbar region was noted. Early in 1955, when asthma was still occurring occasionally, the patient complained for the first time of feelings of discomfort in the epigastrium and lower chest, with some postprandial discomfort but no pain. The patient had marked tenderness over the xiphoid and xiphisternal junction. Radiography of the stomach, duodenum and gall-bladder revealed no abnormality. By early 1956, the symptoms had disappeared but tenderness on pressure was still present at the time of the last examination. Topical application of ethyl chloride spray and procaine injections to the involved areas temporarily abolished symptoms.

DISCUSSION

There was no history of chest or abdominal injury in either case which might have given rise to xiphidalgia. The activities of daily life in neither case involved constant or intermittent pressure to the area of tenderness. Physical examination revealed no obvious xiphoid abnormality. The tenderness may possibly have been present for some time before detection in each case. Marked obesity, psychoneurosis and myocardial insufficiency complicated the first case. The insufficiency was demonstrable by E.C.G. but there was no sign of congestive cardiac failure. Chest pain was not typical of that found in cases of myocardial insufficiency. Bronchial asthma often accompanied the pain and also occurred independently of it. It seems probable in the first case that xiphidynia was related to the psychoneurosis, obesity and cardiac condition rather than to asthma.

In the second case, none of the disease conditions commonly associated with xiphidynia was present. In both cases, local anæsthesia applied to the area of the xiphoid temporarily abolished tenderness and pain. It also seemed to alleviate dyspnœa when present in the first case. Dyspnœa was never detectable when pressure was being applied in the second case. There was a spontaneous partial remission in both cases over the course of several months. Since the two cases which have been presented were first observed, 200 consecutive patients with bronchial asthma have been examined either when attacks were present, during remissions, or in symptom-free intervals. None has been observed to have xiphidynia.

SUMMARY

1. Two cases have been presented in which xiphidynia has been observed as a concomitant of asthma. In the first case, obesity, psychoneurosis and myocardial insufficiency were complicating features. In the second case, bronchial asthma was the only demonstrable disease with bearing on the xiphidynia. Gastro-intestinal discomfort occurred but radiographs of the stomach, gall-bladder and duodenum were negative.

2. Pressure on the xiphoid reproduced pain and occasionally asthma in the first case, and pain only in the second.

3. In neither case was there any connection between the frequency and severity of asthma and the degree of tenderness and pain in the xiphoid.

4. In both cases there was a partial regression of pain and tenderness spontaneously.

5. Only temporary relief was obtained by the topical use of local anæsthesia.

6. On the basis of these observations, xiphidynia, when it occurs, should be regarded as a concomitant rather than as a cause of asthma. The reverse is also true.

7. The literature on xiphidynia has been reviewed.

I wish to express my gratitude to Dr. Charles R. Scriver, of the resident staff of the Montreal Children's Hospital, for valuable assistance with the first case.

REFERENCES

1. POLAILLON, J. F. B.: *Union méd.*, 23: 323, 1877.
2. FENZ, E.: *München. med. Wchnschr.*, 89: 210, 1942.
3. DIEULAFE, R.: *Presse méd.*, 61: 1044, 1953.
4. LINOLI, O.: *Clin. Ann. Med., Milano*, 140: 225, 1852.
5. HANLON, C. R. AND MILLER, M. M.: *J. A. M. A.*, 154: 992, 1954.
6. NARAT, J. K.: *Illinois M. J.*, 42: 27, 1922.
7. LIPKIN, M., FULTON, L. A. AND WOLFSON, E. A.: *New England J. Med.*, 253: 591, 1955.

CORRIGENDUM

In the case report on milkers' nodules, by Dr. A. G. Duncan (*Canad. M. A. J.*, August 15, 1957, 77: 342) there is an error in the laboratory findings on page 342. Lines 5 and 6 from the top of the page, column one should be changed to read "%; white cells 10,400; differential: neutrophils 72, eosinophils 4, lymphocytes 21, monocytes 3."

Canad. M. A. J.
Sept. 15, 1957, vol. 77

INTESTINAL OBSTRUCTION — A HERETOFORE UNDESCRIBED VISCERAL MANIFESTATION OF ALLERGY TO PENICILLIN*

ALAN A. BASSETT, M.D.† and
LOUIS J. COLE, M.D.,‡ *Toronto*

J.R., a 63-year-old white male sales manager, was admitted to the New Mount Sinai Hospital on November 13, 1955, because of abdominal pain and vomiting. He had enjoyed good health until September 30, 1955, when he suffered a contusion and small laceration on the dorsum of his left foot. This was sustained in the course of carrying out his usual duties at a bottle factory. He received local symptomatic treatment to the foot. Because a local swelling and cellulitis developed, intramuscular penicillin (600,000 units procaine penicillin daily on three successive days) was administered by his attending physician.

He was first seen by one of us (A.A.B.) on October 15, 1955, when an abscess was drained at the affected site. Culture of the pus from this abscess yielded *Staphylococcus aureus*. At this time, he developed a generalized moderate urticaria, which was treated unsuccessfully with antihistamines. There had been no previous evidence of allergic diathesis. These skin lesions were followed within a week by generalized, severe erythema multiforme affecting his face, trunk and extremities. The lesions soon became bullous and finally hæmorrhagic (Fig. 1). The consulting dermatologist (Dr. J. Goodman) attributed the skin condition to a penicillin reaction. With local applications and oral prednisone (Meticorten), the skin lesions slowly subsided and cleared over the following 3½ weeks.

During the height of the hæmorrhagic eruption, the patient began to experience cramping, mid-abdominal pain, nausea, and mild diarrhœa without evident blood or mucus. At this time, the steroid therapy was discontinued. The diarrhœa ceased after a few days; but vomiting, abdominal distension, severe cramping pain and constipation followed.

He was seen by the second author (L.J.C.) the day before admission, viz. about two weeks after the onset of his gastro-intestinal symptoms. There had been no bowel movement, nor had any flatus been passed for over 48 hours. Examination revealed a very ill man, exhausted and dehydrated, who had evidently lost considerable weight, and was emitting fæcal vomitus. The temperature was 99.9° F., pulse 110, respirations 18, and blood pressure 110/70 mm. Hg. Except for moderate pulmonary emphysema and scattered healing black skin lesions, the significant findings were in the abdomen. The abdomen was moderately distended. There was generalized tenderness, rebound, and slight muscle guarding, all most marked toward the left upper quadrant. Occasional peristaltic rushes and fluid tinkles were heard in the left upper abdomen. The rectal examination was negative, and the ampulla dilated.

Laboratory findings.—The urinalysis was negative, specific gravity 1.023.

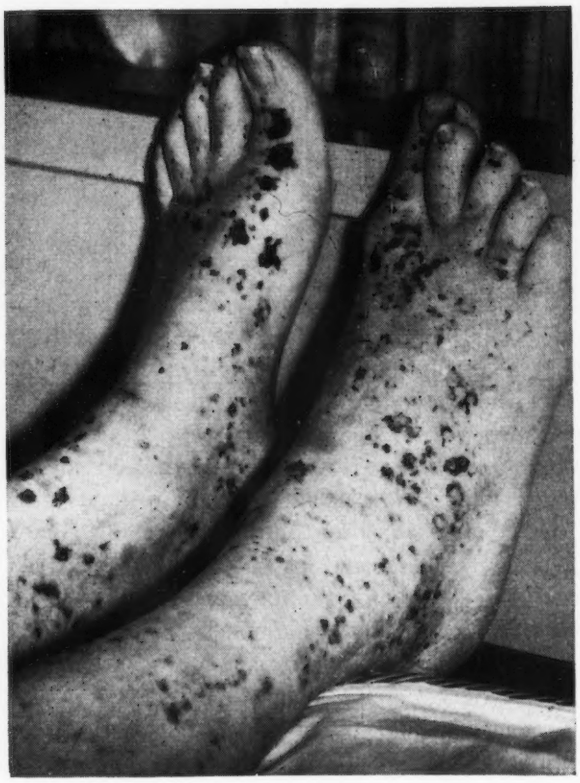


Fig. 1

Examination of the blood.—Hb. value 84%. Red cell count 4.3 million, white cell count 16,400. Differential: Neutrophils 82, stabs. 4, lymphocytes 7, monocytes 5, eosinophils 0.5%. The blood non-protein nitrogen was 38 mg. %, the CO_2 content 37 vol. %; chlorides 98.5 mEq./l; sodium 135 mEq./l; potassium 4 mEq./l. The prothrombin time was normal, and the blood Wassermann reaction negative.

A radiograph of the chest was reported normal except for slight elevation of the right dome of the diaphragm. A flat plate of the abdomen was interpreted as showing distended loops of upper small bowel. The barium enema was normal, as were the appendix and terminal ileum, which were visualized by reflux.

The patient was treated with naso-gastric suction via a Cantor tube (which was passed into the duodenum), fluid and electrolyte replacement, and blood transfusion. His general appearance improved remarkably, and the pain disappeared. However, abdominal distension, constipation, and failure to pass flatus persisted. Repeated enemata were ineffective. Serial abdominal films over a period of

*Presented at a meeting of the Academy of Medicine, Toronto, November 13, 1956.
†Attending surgeon, Co-chairman, Tumour Committee, New Mount Sinai Hospital, Toronto.
‡Attending physician, attending physician-in-charge, Gastrointestinal Clinic, New Mount Sinai Hospital, Toronto.

72 hours indicated persistent small bowel obstruction. On the third hospital day, 150 c.c. of barium mixture were introduced through the Cantor tube. Very marked dilatation of the jejunum was noted, and after two hours, a trickle of barium was seen to enter the ileum (Fig. 2.). Leukocyte and differential count were essentially unchanged. Because of the persisting small bowel obstruction (though it was evidently not complete), an operation was performed on the third hospital day.

Operative findings.—There was no free fluid present. The proximal small bowel was dilated and œdematous. About two feet distal to the ligament of Treitz, an area of mucosal thickening with luminal constriction was noted. There were actually numerous areas of mucosal thickening in the small bowel, but obstruction had occurred only in the proximal segment of jejunum. Almost the entire small bowel and mesentery were œdematous and plastered with ecchymotic areas. A jejunotomy at the site of obstruction disclosed only an intensely œdematous mucosa without ulceration or bleeding. This area was biopsied and the abdomen closed.

Pathological report (Dr. H. J. Pritzker).—Numerous plasma cells are seen in the lamina propria, but eosinophils are rare. The submucosa has a very loose and œdematous stroma with an infiltration of round cells. The blood vessels are dilated and congested.

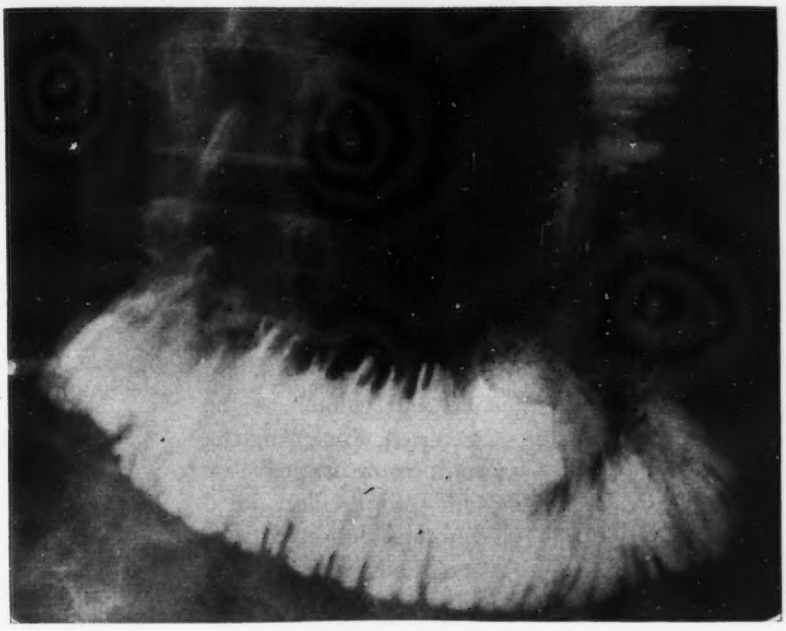


Fig. 2

Postoperatively the patient's course was uneventful, but bowel function was not normal until the seventh postoperative day. He was discharged, asymptomatic, on December 4, 1955, viz. 21 days after admission and nine weeks after the original accident. He has remained well during the interim, and when last seen three months ago was in excellent health.

DISCUSSION

Exposure to antibiotics is now commonplace, because of the widespread use of a variety of drugs, ointments, drops, lozenges, and even chewing gum. These predispose to the development of sensitivity and allergic reactions. A history of previous exposure may be difficult to obtain. These reactions may occur in a patient without previous allergic manifestations, although they are often more severe in the allergic individual.

Most of the time, the use of antibiotics is not associated with any significant untoward effect. However, in recent years, with larger doses and repeated injections, particularly of intramuscular long-acting penicillin, increasing numbers of sensitivity reactions are appearing. Oral penicillin may produce sensitivity reactions and even anaphylaxis, just as penicillin does by any other route of administration.[1] The reported incidence of reactions varies between 1 and 10%.[2] These include the immediately fatal anaphylactic reaction, serum sickness syndrome, angioneurotic œdema, exfoliative dermatitis, hæmatological disorders, neurotoxic effects, renal and hepatic disturbances, and necrotizing angiitis. In a person known to be allergic to penicillin, it is best to use a different drug and not a different type of penicillin.

Gastro-intestinal manifestations of allergy are common and have been known for almost 100 years. They may result from inhaled, ingested or injected allergens.[3] The allergic reaction may involve the whole wall of the gut, but more frequently the manifestations are essentially mucosal. The symptoms are not characteristic. They include abdominal colic, nausea, vomiting, diarrhœa, glossitis, stomatitis, œsophagitis, some cases of irritable bowel syndrome, and pruritus ani. We have on two occasions observed giant hives in the mucosa of the rectum and sigmoid during sigmoidoscopic examination in patients with severe diarrhœa on an allergic basis. Similar observations have been noted gastroscopically.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

Localized severe reactions with marked œdema, spasm and induration of the intestinal wall have been reported to cause confusion with an acute abdomen, even grossly simulating regional enteritis.[4] Despite this, a diagnosis of gastro-intestinal allergy may be most difficult to establish and is only warranted after careful study, even in the known allergic individual.

Early in this century Osler discussed the visceral manifestations of the erythema group of skin disease, commenting on the frequency of abdominal pain and at times diarrhœa and blood in the stools. Approximately 35 years previously, Henoch had noted the association of gastro-intestinal symptoms with purpura. We are now reporting a case of intestinal obstruction complicating hæmorrhagic erythema multiforme bullosum due to a penicillin reaction. In clinical and experimental hypersensitivity reactions, the vascular reaction stands out. Indeed, in 1950, Berne reported a case of fatal sensitivity reaction to penicillin, where a striking finding was a necrotizing angiitis with multiple ulcerations of the small intestine and colon.[5] In the case under discussion, the lesion was primarily a mural one. Erythema multiforme is probably best regarded as a symptom complex and not a disease entity. It may be due to infections, drugs, or sera, or found in association with chronic visceral disease such as carcinoma. The skin manifestations may be associated with lesions in the eyes, joints, oral mucosa, pharynx, larynx, tracheo-bronchial tree, œsophagus, genitalia and rectum. As a rule, there is little constitutional upset. It is the variety of combinations of lesions in certain locations which has resulted in a number of so-called syndromes, such as Stevens-Johnson's, Behcet's and Reiter's. These are probably all variants of erythema multiforme exudativum.[6] The particular visceral manifestations reported by us have not been previously noted.

The ruling of the local Workmen's Compensation Board in this case is significant. The Board agreed that the entire illness was a direct result of the accident suffered during his occupation and the treatment instituted. Consequently, the Workmen's Compensation Board assumed full responsibility for the medical and hospital expenses involved.

SUMMARY

1. A previously unrecognized or unreported complication of penicillin reaction has been described.

2. Because toxic reactions to the antibiotics are relatively infrequent and generally mild, and because of their extreme usefulness in treatment, we have all developed a complacency about their use. As with every therapeutic tool, however, there is a definite risk which makes it essential for all of us to maintain rigid indications for their use.

A. A. Bassett: 394 Bloor St. West.
L. J. Cole: 158 St. George St.

REFERENCES

1. PETERS, G. A., HENDERSON, L. L. AND PRICKMAN, L. E.: *Proc. Staff Meet. Mayo Clin.*, 30: 634, 1955.
2. LOWELL, F. C.: *Ann. Int. Med.*, 43: 333, 1955.
3. WITHERS, O. R.: *Ann. Allergy*, 11: 637, 1953.
4. ANDRESEN, A. F. R.: *Gastroenterology*, 23: 20, 1953.
5. BERNE, R. M.: *New England J. Med.*, 242: 814, 1950.
6. ROBINSON, H. M., JR.: *M. Clin. North America*, 35: 315, 1951.
7. KAGAN, B. M. AND FALLER, L.: *Ibid.*, 39: 111, 1955.

MELORHEOSTOSIS: A CASE REPORT*

K. S. MORTON, M.D., C.M., M.Sc., F.R.C.S.[C.], *Vancouver, B.C.*

MELORHEOSTOSIS is a rare condition in which parts of bones are petrosed. According to Fairbank[1] it was described first in 1922 by Leri and Joanny. It differs from osteopetrosis in that the changes are confined to the bones of one limb, the outline of the bone is eventually distorted, pain is frequent and limitation of joint movement is common.

Fairbank[1] states further that only four unquestionable cases had been reported in Britain by 1951, though in 1955 he mentions over 70 such cases collected from the literature.

The following case, the diagnosis of which has been confirmed by Sir Thomas Fairbank,[2] is the only one of melorheostosis on record at the Vancouver General Hospital. Because of its rarity and the rather typical nature of this case, it was thought to be worth reporting.

CASE HISTORY

A 63-year-old man presented himself with the complaint of weakness of both legs. He gave a poor

*From the Department of Orthopædic Surgery, Vancouver General Hospital.

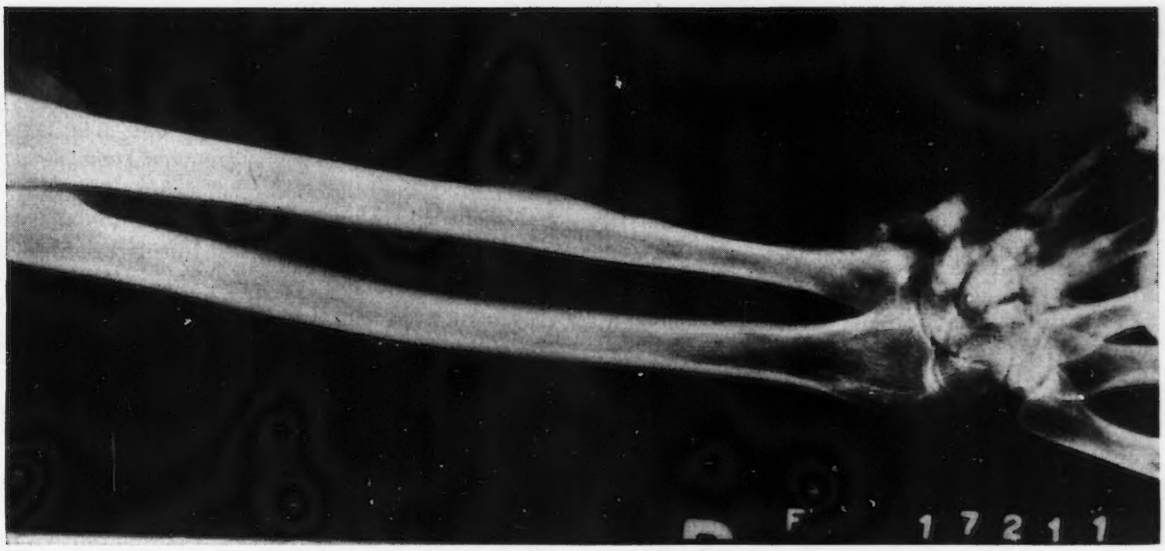


Fig. 1.—The "ulnar distribution" of the lesion is apparent.

history but stated he was perfectly well and able to work as a cook until 2½ years previously. He had had two recent admissions to hospital, the first in July 1953, at which time pain and swelling about the right knee, a temperature of 102° F., and an erythrocyte sedimentation rate of 45 to 95 mm. in one hour were the basis of a diagnosis of septic or rheumatoid arthritis. The second admission in April 1955 was for weakness of both legs; and admission temperature of 101° F. subsided and he was discharged one week later after hæmatological, urine and cerebrospinal fluid examinations proved negative.

It had been noted that he had a flexion deformity at the right elbow and, as well, of the fourth and fifth fingers of his right hand, which gave rise to no complaints. Indeed, he insisted that these deformities had been present "since birth", had not progressed and gave rise to no pain or disability.

Family history was sketchy. His mother was an invalid, suffering from "paralysis" and "arthritis"; his father died of cancer. He had no knowledge of a brother and a sister.

PHYSICAL EXAMINATION

He appeared older than 63 years and walked unsteadily on a wide base. Rombergism was present. Blood pressure 150/100 mm. Hg; pulse 80 with an occasional extrasystole. Examination of the chest and abdomen was essentially negative.

Lower extremities: there were markedly pronated flat feet and an adequate range of movement at hips and knees. There was no atrophy of calf or thigh, and muscle power was good, sensation intact. Deep reflexes at the knee were physiological but they were depressed at the right ankle, absent at the left ankle. There were two patches of erythema, one over the right second toe and a second on the left calf; this second lesion appeared as dilated venules and emptied on elevation or digital pressure.

Upper extremities: the left upper extremity was intact. Though right shoulder movement was normal, the right elbow extended only to 105° and flexed to 60°. Pronation was absent, supination 45°. The wrist was held in 10° ulnar deviation though correction to neutral was possible; it dorsiflexed 10°, palmar flexed 40°. The right fourth and fifth fingers were held in acute flexion into the palm, there being 80° of movement at metacarpophalangeal joints, about 10° at proximal interphalangeal joints. There was one-half inch (1.25 cm.) atrophy of the right forearm and arm; the right triceps jerk was absent.

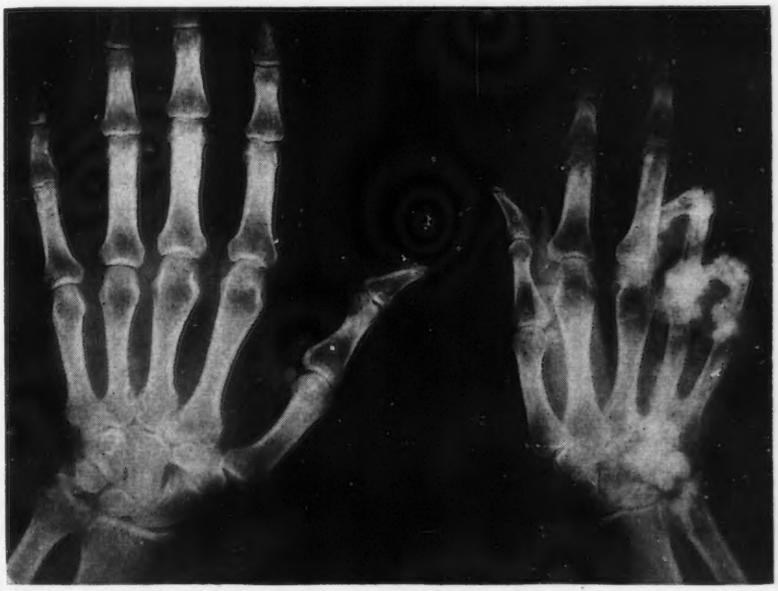


Fig. 2.—Shows calcific deposits in soft tissues and "ulnar distribution" in the hand.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

The cephalic vein was dilated and tortuous and could be traced from the dorsum of the hand to the infraclavicular fossa. There was a fine, soft nodularity in the subcutaneous tissue of the flexor surface of the forearm, overlain by several dilated venules. In addition, extending from the wrist flexion crease proximally two inches and from the mid-dorsal line to the mid-ventral line on the ulnar side, there was a soft-tissue mass appearing as an area of localized chronic lymphœdema. About the elbow, several bony hard nodules could be palpated, movable in the subcutaneous tissue. These ranged in size from one-half to three cm. in diameter and were not tender. The radial pulse at the right wrist could be palpated only poorly, the ulnar pulse not at all.

LABORATORY INVESTIGATIONS

Hæmoglobin level 12.4 g. % (86%); E.S.R. 12 mm. in one hour; white cell count 11,050; differential count: polymorphonuclears 64%, staff cells 2%, lymphocytes 34%; Kahn test negative. Total protein 6.3 g. %; albumin 4.6 g. %; globulin 1.7 g. %.

Calcium 5.1 mEq/l. (10.2 mg. %); phosphorus 1.2 mEq/l. (2.2 mg. %); alkaline phosphatase 7 King-Armstrong units; acid phosphatase 1.8 King-Armstrong units.

Urinalysis: pH 4.5; protein, sugar and acetone negative; 1 plus, white blood cells.

DISCUSSION

The diagnosis of melorheostosis is a radiological one. Characteristic is a dense, structureless sclerosis "flowing like candle-grease" and often appearing to follow the distribution of a main vessel or nerve. In this case, such a distribution, apparently following the ulnar nerve, is seen (Fig. 1). The involvement is patchy in contrast to osteopetrosis and may be endosteal or cortical. Deposits of bone in periarticular soft tissues are seen, as in this case (Figs. 1 and 2), and areas of decreased bone density are also common. Pain, described as the most frequent symptom by Fairbank,[1] was absent in this case; limitation of movement was present though not a complaint. The deformity of the ulnar two fingers and the venous abnormality were notable in this case.

REFERENCES

1. FAIRBANK, SIR THOMAS: An atlas of general affections of the skeleton, E. & S. Livingstone, Ltd., Edinburgh, 1951, p. 49.
2. *Idem*: Personal communication.

A CASE OF THE NARCOLEPSY-CATAPLEXY SYNDROME*

J. TODD, M.B., B.S., D.P.M.,
Menston, Yorks., England

IN 1877, Westphal[19] published the first case of a patient troubled by brief but irresistible attacks of diurnal sleep. Soon afterwards, Gélineau[12] described a similar case, and applied the term "narcolepsy" to this particular form of sleep disorder. With wider experience, it became evident that a tendency to narcolepsy was commonly associated with a proclivity to attacks of emotionally induced muscular weakness; thus, many narcoleptic subjects are apt to buckle at the knees, or even fall to the ground, when amused, frightened, or angered by some environmental situation. Adie[1] was the first to apply the term "cataplexy" to these emotionally induced attacks of muscular hypotonia. The researches of Wilson,[22] Levin,[13] Daniels,[7] and Brain[5] have shown that the purview of the narcolepsy-cataplexy syndrome should be extended to include a group of *ancillary* symptoms: catalepsy, amnesic states, diurnal somnambulism, sleep-paralysis, hallucinatory episodes, vivid dreams, and adiposo-genital dystrophy.

The two major symptoms—narcolepsy and cataplexy—are not "cardinal" in the strict sense of the word, since either may appear alone without (in the writer's opinion) invalidating a diagnosis of "narcolepsy-cataplexy syndrome". In this connection, it is noteworthy that narcolepsy may antedate by several years the appearance of cataplexy, or vice versa.[7, 20] Moreover, the two main symptoms are subject to substitutions and transitions of various kinds:[20] sleep attacks may be induced by emotion, cataplectic attacks may occur spontaneously, cataplectic attacks may terminate in sleep, and an attack of cataplexy may replace narcoleptic sleep if the latter is prevented by deliberate interference. The ancillary symptoms are often encountered apart from the narcolepsy-cataplexy combination, but their incidence is significantly high *in conjunction with it.* All writers on the subject agree that narcolepsy occurs more frequently in the male; in a group of 66 cases studied by Levin,[13] the ratio of male to female cases was 5:1.

---

*Menston Hospital, Menston, Yorks., England.

The following case of the narcolepsy-cataplexy syndrome has some interesting features.

An intelligent man, aged 42 years,, was referred to an out-patient clinic because of a group of symptoms which had troubled him for three years. These symptoms consisted in attacks of diurnal sleep and emotionally induced muscular weakness; moreover, he had developed a proclivity to nocturnal hallucinatory experiences and vivid dreams. He had gained 28 lb. in weight since the onset of his narcolepsy, although he had not become noticeably obese. There had been no loss of libido, but his sexual appetite had never been strong.

DIURNAL SYMPTOMS

Narcoleptic attacks.—The attacks of sleep were a source of embarrassment to him as they were irresistible and liable to supervene at any time. On one occasion, he fell asleep in the act of filling in the passport of a business client, his pen jerking across the page as he slumped over his desk; on another, he was overcome by sleep while eating a meal, his fork coming to rest at a point half way between his plate and mouth. He gave the following general account of his narcoleptic naps: "The sleepiness will occur at any time of day, maybe as little as half an hour after rising from a good night's sleep; the sleep is not very deep, perhaps of 20 minutes' duration if I were undisturbed. Prior to an attack there is no feeling of tiredness. I have, on occasion, dozed off in the middle of a conversation, talking nonsense. When this happens, the sound of my own voice arouses me to wakefulness immediately, and I am aware that what I have said was foolish, and had nothing to do with the subject under discussion. While attacks will occur at any time, I find they are certain to occur under certain circumstances. For instance, I find it quite impossible to read at any time of day for more than five minutes . . ." His attempts to ward off attacks of sleep by an effort of will had precipitated double vision and a curious form of metamorphopsia. He described the latter as follows: "Two figures would, without much warning, change position, that is, 32 would become 23 by means of a very graceful leap, each to come to rest in the other's position. Then (in other instances), the whole number would turn a full circle as though on a central pivot." He sometimes dreamed during the spells of narcoleptic sleep. Some of these dreams were so life-like and realistic that, as he put it, "they could have actually happened".

Cataplectic Attacks.—During the attacks of cataplexy, his eyelids droop, his facial muscles twitch (and feel tight), his speech slurs, his arms fall to his side, and his legs sag at the knees. Occasionally, he has been overtaken by a cataplectic attack while holding a cup, the contents of which have been spilled as his right arm has fallen powerless to his side. The spells of cataplexy, which last but a matter of seconds, are not accompanied by any clouding of consciousness. It is of interest that his wife has noticed that the attacks of muscular weakness affect the *right* side of his body more severely than the left. His description of the emotional stimuli liable to provoke an attack was as follows: "With regard to the attacks of limb-weakness and twitching, I find these would occur many times each day, under any amount of circumstances, and I would always be aware what caused it. To cite a few causes, however: if I were contradicted or opposed; if I were saying something I thought clever or witty; if I had a ready answer to someone's problems; if I were the recipient of praise for anything I had done. All these happenings and many others, have brought on attacks." His worst fit of cataplexy was induced by the wave of pleasurable emotion which swept over him on finding himself the possessor of a "grand slam" hand at bridge.

Nocturnal symptoms. — Since the onset of his narcolepsy, he has been troubled during the night by hallucinatory experiences and bizarre dreams. A curious feature of these nocturnal visitations is that a certain theme or pattern would recur again and again. On several occasions, he has woken from a sound sleep with the impression that the bedclothes were being moved by some invisible person or intangible agency. When this happened, his wife (who occupied a separate bed) would be awakend by his restless movements and loud cries. Furthermore, he has repeatedly awakened during the night with the feeling that another body "lighter than a real one" is lying beside him in the bed, and is pressing down upon him. This "presence" seems to be breathing in unison with him. Sometimes, he has vaguely identified the second body with his wife or mother. When experiencing these illusory phenomena, he is convinced that he is fully awake. Nevertheless, he realizes in retrospect that his experiences are akin to dreams. In addition to these hallucinatory episodes, his sleep is disturbed by vivid and bizarre nightmares.

Background history.—There is no history of head injury, encephalitis lethargica, influenza, or epilepsy. He has not been troubled by recurrent headaches, excessive thirst, or nocturia; nor is there a history of intellectual or personality deterioration. When he was 12 years old, he contracted "septicaemia" from septic abrasions on his knees. At that time, he had a high temperature, moderate headache, lymphangitis of his thighs, and a very sore tongue—"it felt as though it had been burnt". The family history is non-contributory.

Physical examination.—The patient was of healthy appearance, but had a sleepy facial expression.

Central nervous system.—There was nothing abnormal discovered in the sensory, motor, or extrapyramidal systems. The retinae were of natural appearance, and the plantar responses were flexor in type. All other systems were normal (B.P. 160/84).

A cataplectic attack was *observed by the writer:* it was noted that the cataplexy was more marked on the patient's *right* side. Examination immediately after recovery showed a notable increase in the activity of all the deep muscular reflexes as compared with their normal state (+). It was note-

worthy that these reflexes were more augmented on the right (+++) than on the left (++).

Special investigations.—Urine: no abnormal constituents; blood, white cells 11,200 per c.mm. (lymphocytes 36%); plasma magnesium, 2.5 mg. %; blood Wassermann negative. Lumbar puncture: a colourless cerebrospinal fluid with normal rate of flow, and normal reaction to jugular vein compression. White cells, 2 per c.mm. (monos.); protein, 20 mg. %; chlorides, 735 mg. %; Lange curve, 0000000000; Wassermann negative. X-ray studies of the skull showed no abnormality. Electroencephalographic examination revealed nothing abnormal.

Response to treatment.—He responded favourably to: Tabs. methylamphetamine mg. 10 b.d. On this medication, his tendency to attacks of narcoleptic sleep and cataplectic weakness was markedly reduced; moreover, he lost his lethargic facies. The beneficial effect of this drug was dramatically shown by the severe relapse which occurred when it was discontinued for 12 hours prior to the electroencephalographic examination. After the electroencephalogram had been taken, he accompanied his wife to the railway station. When running for the train, the wife was surprised to find herself alone. On looking back, she observed her husband standing on the platform in a *deep sleep*. A week after this incident, the patient drew his wife's attention to an infant's crib which was being exhibited on the railway station in support of an appeal by a Catholic society. She was astonished to find that he had no recollection of ever having seen it before, although he had seemingly examined the crib with close attention the previous week.

COMMENTARY ON THE CASE

The absence of any solid evidence of organic disease favours a diagnosis of "idiopathic" narcolepsy. Nevertheless, since there is a history of "septicæmia", it is possible that the hypothalamus did not escape unscathed, but was the site of a minute focal lesion subsequently giving rise to an expanding area of gliosis; if so, the narcolepsy is "symptomatic". The double vision and metamorphopsia, which the patient sometimes experienced at the beginning of a narcoleptic attack, are noteworthy features of the case; the visual illusion of transposition of written symbols, or their rotation through a circle, has probably not been described before in connection with narcolepsy. The cataplectic attacks are of interest in view of the accompanying localized rigidity of the facial muscles, which Daniels[7] describes as "among the less common features of cataplexy". The twitching of the facial musculature resembled that often seen in petit mal attacks; Symonds,[18] who observed a similar attack in a narcoleptic, confessed difficulty in deciding whether or not he had witnessed a cataplectic attack or a petit mal seizure. The post-cataplectic exaggeration of the deep muscular reflexes observed in this case seems to have been noted by Wilson[22] in another; it is doubtless a form of rebound phenomenon, as the deep muscular reflexes are known to be abolished *during* an actual attack. It is noteworthy that the patient could laugh at a joke without suffering an attack of cataplexy, provided he was not intimately and *personally* involved therein. His recurrent impression of being in the presence of an invisible and intangible bedmate is probably in the nature of a kinæsthetic hallucination. The identification of the "presence" with his mother may be of considerable psychological import. The blood-lymphocyte count (high normal) merits attention, as claims have been made that a relative lymphocytosis is a feature of narcolepsy. But Pond has pointed out that the lymphocyte counts in published cases do not differ significantly from those obtained in a normal group. The normal plasma-magnesium level is worthy of note, as high levels have been found in narcoleptic subjects.[15]

DISCUSSION

Neuropathological and neurophysiological considerations.—Symptomatic and idiopathic forms of narcolepsy are recognized. According to Brain,[6] symptomatic narcolepsy is usually due to head injury, cerebral arteriosclerosis, neurosyphilis, encephalitis lethargica or intracranial tumour involving the posterior hypothalamus. Dunlop[8] *et al.* hold that narcolepsy may be *the only sign of an attack of encephalitis lethargica.*

Until the last decade, the attention of neurophysiologists was firmly focused on the posterior hypothalamus when seeking an explanation for the phenomena of narcolepsy. Thus, Fulton and Bailey[10] expressed the belief that the neural mechanisms concerned with sleep regulation were situated in the posterior part of the hypothalamus near the midbrain. Furthermore, the concept of a "sleep-waking centre" in the posterior hypothalamus seemed to accord with clinical experience, as lesions associated with disorders of sleep were often located in this area. But the attention of those interested in the problems of narcolepsy and cataplexy has recently been diverted from the hypothalamus to the brain-stem and the cingulate gyrus.

Magoun (cited by Aird[2]) with the assistance of co-workers has demonstrated the presence of activating and inhibitory systems in the reticular formation of the brain-stem of the cat. According to Aird,[2] Magoun's experiments showed that stimulation of the ascending activating system underlies wakefulness, and absence of this influence results in sleep; on the other hand, stimulation of the inhibitory system in the bulbar reticular formation inhibits muscle tone. These observations would appear to be of considerable significance as there is evidence that amphetamine drugs, which are so efficacious in preventing narcoleptic and cataleptic attacks, exert their pharmacological action at the level of the reticular systems in the brain-stem.[3, 4] It is noteworthy that Carulla,[7] after a careful appraisal of the clinical and experimental evidence, concluded that the brain-stem systems described by Magoun have a significant part to play in the mechanism of cataplexy.

During the last few years, clinical and experimental data have been obtained which seem to show that the anterior part of the gyrus cinguli (Brodmann's "area 24") is both a powerful suppressor area and a centre for the elaboration of the emotions (Smith[17] and Ward[19]). The possibility that cataplexy may sometimes be the result of a transient disturbance of function in Brodmann's "area 24" has lately been examined by Carulla,[7] but this writer came to no firm conclusion in the matter. In any case, *narcolepsy* cannot be explained in terms of a disturbance of function affecting the anterior part of the gyrus cinguli.

In view of what has been said, it is of interest that the reticular systems in the brain-stem, the posterior hypothalamus, and the gyrus cinguli, may be interconnected by fibre-tracts. Ward,[19] by using the Marchi technique, has demonstrated the presence in monkeys (*Macaca mulatta*) of a pathway from the anterior limbic region to the reticular formation in the mesencephalon; Murphy and Gellhorn[16] have shown that the application of strychnine to the gyrus cinguli (and certain other cortical areas) of the cat results in the appearance of "spike potentials" in the anterior and posterior hypothalamus (positive evidence of fibre-tract connections between strychninized cortical areas and the aforesaid basal nuclei); and Ingram (cited by Wechsler[20]) has described the existence of centrifugal projections from the hypothalamus to the brain-stem.

These neuropathological and neurophysiological considerations suggest that symptomatic narcolepsy and cataplexy result from lesions in the posterior hypothalamus or the brain-stem, and that these produce their effect by disturbing the normal operation of the brain-stem reticular systems.

The ancillary symptoms of the narcolepsy-cataplexy syndrome.—Narcoleptic sleep has a characteristic tendency to vary in *depth* and to assume *partial* forms. The cataplectic component, and nearly all the ancillary moieties, are explicable in terms of incomplete modes of sleep, assuming that sleep and inhibition are for practical purposes the same thing. Cataplexy can be regarded as a state of inhibition ("sleep") confined to the motor cortex and the subcortical postural centres, those areas of cortex which subserve the function of consciousness remaining active; a variety of cataplexy is sleep-paralysis, in which the subject finds himself unable to move on awakening. In the state of catalepsy, wherein the conscious subject is unable to move but can maintain a standing posture, the motor cortex alone is inhibited ("asleep"). The diurnal somnabulism and amnesic episodes, in which the subject performs complex motor activities without subsequent recollection of his behaviour, are explicable in terms of an inhibitory state ("sleep") affecting the cortical areas subserving consciousness with simultaneous sparing of the motor cortex and subcortical postural centres. Hypnagogic hallucinations are probably *modified dreams* which are perceived while the subject is suspended between sleep and wakefulness. Since hypnagogic dreams presumably result from an uneven and partial inhibition of the cerebral cortex—a medley of sleep and wakefulness—it is scarcely surprising that they differ in material respects from ordinary ones: the visual hallucinations of the hypnagogic state are more vivid and more often coloured than those of ordinary dreams; in addition, auditory hallucinations are confined to the hypnagogic type of dream. These hypnagogic hallucinations resemble in some respects the more elaborate visual and auditory auras experienced by certain epileptic subjects. Both hypnagogic hallucinations and epileptic auras often assume the form of a reiterated pattern, and they are intimately associated with, and often accompanied by,

illusional changes in the size and shape of the body. It is perhaps to be expected that the manifestations of epilepsy and incomplete sleep resemble one another in certain respects, as in both conditions the cerebral cortex is divided into relatively active and relatively inactive zones; as a result, the psychophysiological integration of the cerebral cortex is temporarily dissolved.

The diurnal and nocturnal hallucinatory episodes of narcoleptic patients are likewise attributable to dreams that have invaded the consciousness of an individual, who is perhaps only nine-tenths awake at the time. On the other hand, the realistic and life-like "dreams" sometimes experienced by the narcoleptic patient during attacks of sleep are probably produced by the assimilation of actual events into the general pattern of sleep; in such cases, it is likely that some cortical analyzers remain active, while the rest of the brain is asleep. The interpretation of real happenings as dreams, or dreams as hallucinations, will be governed by the relative degree of somnolence or wakefulness which prevails at the time. The hallucinations of narcoleptic patients are probably produced in much the same way as the so-called "peduncular hallucinations"[14] of patients with lesions in the general vicinity of the sleep-waking centre.

Many narcoleptic patients display some degree of adiposo-genital dystrophy. Daniels[7] states that obesity was present in 56% of 147 cases of narcolepsy studied at the Mayo Clinic. Narcoleptic obesity is presumably of hypothalamic origin; if so, it probably results from hyperphagia.[10] The narcoleptic subject's gain in weight usually *coincides* with the onset of the other symptoms. Narcolepsy may also be associated with loss of libido or the development of impotence,[7] but the incidence of hypogonadism is much less than that of obesity.

Narcolepsy as an example of phylogenetic regression.—Normal sleep is probably inaugurated by the co-ordinated action of the cerebral cortex and a hypothalamic sleep-waking centre, the latter being under the domination of the former. In narcolepsy, the phylogenetically older mechanism appears to have regained its autonomy; as a result, sleep not only supervenes in an irregular manner, but tends to undergo sequestration into its elemental components. A comparison between narcoleptic sleep and infantile sleep is instructive. The human infant resembles many of the lower animals in displaying a polyphasic sleep rhythm. The facts of natural history are as follows: during the 24 hours of the day, the new-born baby sleeps five times, the mouse nine times, the rat ten times, and the rabbit up to 20 times. In this context, the observation of Kleitman and Camille (cited by Brain[5]) that dogs—usually monophasic sleepers—exhibit polyphasic sleep after decortication, is of considerable interest. These facts, when taken in conjunction with the infant's tendency to fall asleep precipitately, suggest that narcolepsy is in the nature of a *phylogenetic regression.* Cataplexy may likewise be a psychophysiological relic, for it is reminiscent of that curious form of maladaptation (doubtless a perversion of the "still reaction") whereby the rabbit is immobilized in the presence of the stoat. It is noteworthy that many normal individuals are aware of a momentary weakness of their muscles when emotionally excited; indeed, this experience is so common that it has given rise to such expressions as "helpless with laughter" and "struck all of a heap". It is possible that this phenomenon results from the feeble revival of an atavistic reaction which, when fully reactivated by release from cortical control, appears in the guise of an attack of cataplexy. The fact that cataplectic attacks may be produced by emotions other than fear is not really surprising, as the various emotions are united by "final common paths" and interconnecting bonds. For example, secretion of tears may accompany sorrow, fear, anger, or laughter; blushing of the cheeks may accompany anger, shame, or pleasure; and pallor of the cheeks may accompany fear or anger (adrenaline effect). Furthermore, fear-producing situations may provoke an outburst of laughter.

The two major symptoms of the narcolepsy-cataplexy syndrome promote speculation. Is Man the descendent of a primeval ancestor which was a polyphasic sleeper, and which used the "still reaction" in its defence?

SUMMARY

The purview of the narcolepsy-cataplexy syndrome has been defined. In addition to the major symptoms—narcolepsy and cataplexy—there are a group of ancillary symptoms: catalepsy, amnesic states, diurnal somnambulism, sleep-paralysis, hallucinatory episodes, vivid dreams, and adiposo-genital dystrophy. Narco-

lepsy may antedate the appearance of cataplexy by a number of years, or vice versa. A case of the syndrome has been described illustrating not only the classical features of the narcolepsy-cataplexy complex, but also some rare phenomena. Certain aspects of the neurophysiology and neuropathology of the syndrome have been discussed. Moreover, the mode of production of the ancillary symptoms has been studied. Lastly, the concept of narcolepsy and cataplexy as examples of phylogenetic regression has been examined.

REFERENCES

1. ADIE, W. J.: *Brain*, 49: 257, 1926.
2. AIRD, R. B., GORDON, N. S. AND GREGG, H. C.: *A.M.A. Arch. Neurol. & Psychiat.*, 70: 510, 1953.
3. BRADLEY, P. B. AND ELKES, J.: *J. Physiol.*, 120: 13P, 1953.
4. BRADLEY, P. B. AND HANCE, A. J.: *Ibid.*, 129: 50P, 1955.
5. BRAIN, W. R.: *Brit. M. J.*, 2: 51, 1939.
6. *Idem*: Diseases of the nervous system, 2nd ed., Oxford University Press, London, 1940.
7. FUSTER DE CARULLA, J.: *Confinia neurol.*, 15: 360, 1955.
8. DANIELS, L. E.: *Medicine*, 13: 1, 1934.
9. DUNLOP, D. M., DAVIDSON, L. S. P. AND MCNEE, J.: Textbook of medical treatment, 6th ed., E. & S. Livingstone Ltd., London, 1953.
10. FULTON, J. F. AND BAILEY, P.: *J. Nerv. & Ment. Dis.*, 69: 1, 145, 261, 1929.
11. FULTON, J. F.: Physiology of the nervous system, 2nd ed., Oxford University Press, London, 1943.
12. GÉLINEAU: *Gaz. d. hôp., Par.*, 53: 626, 1880.
13. LEVIN, M.: *Arch. Neurol. & Psychiat.*, 22: 1172, 1929.
14. L'HERMITTE, J. J.: Les hallucinations, clinique et physio-pathologie, Gaston Doin & Cie, Paris, 1951.
15. MEEK, E. S.: Personal communication.
16. MURPHY, J. P. AND GELLHORN, E.: *J. Neurophysiol.*, 8: 431, 1945.
17. SMITH, W. K.: *Ibid.*, 8: 241, 1945.
18. SYMONDS, C. P.: *Lancet*, 2: 1214, 1926.
19. WARD, A. A., JR.: *J. Neurophysiol.*, 11: 13, 1948.
20. WECHSLER, I. S.: *Brit. M. J.*, 2: 375, 1956.
21. WESTPHAL, C.: *Arch. Psychiat. u. Nervenkr.*, 7: 631, 1877.
22. WILSON, S. A. K.: Neurology, 2nd ed., Butterworth & Co. Ltd., London, 1955.

PATENT URACHUS CONTAINING A CALCULUS

S/L DENIS F. DOCHERTY, M.A., M.D., F.R.C.S.,* *Cold Lake, Alta.*

PATENT URACHUS is a well-known pathological and clinical entity. Classically this condition manifests itself in the aged, the reason being that contraction of the bladder commences at the apex of the organ and passes towards the base. A patent urachus opening as it does at the extreme apex of the bladder is temporarily closed during micturition, and so the potential urinary stream to the umbilicus is cut off. Because of this, the fistula remains unobtrusive until the bladder is overfull, usually due to some form of obstruction, e.g. enlarged prostate. Embryologically a patent urachus is due to persistence of the allantois. The case described below is interesting in that the patient was aged 22 years and that he passed a calculus at the umbilicus by way of his patent urachus.

J.C., a 22-year-old airman, was admitted to this hospital with a history that for the previous four weeks he had been passing fluid which had a distinct uriniferous odour through his umbilicus. He stated quite emphatically that this had commenced quite spontaneously without any feeling of obstruction to normal micturition. At first it had been a mere trickle but it had been getting progressively worse until at the time of examination he could produce fluid at his umbilicus by voluntarily straining. He had never complained of any such trouble before this attack. On examination at the time of admission, he was seen to be a young man, well nourished and of good colour. There was a definite continuous watery discharge from the umbilicus, which by this time had become quite raw and irritated. This fluid had a distinct uriniferous odour. He could increase the rate of flow by straining.

Investigation.—Examination of this fluid for urea was positive. Urinalysis showed some pus cells in the urine, otherwise nothing abnormal. A cystoscopic examination was most revealing. It showed a distinct opening at the apex of the bladder. A ureteric catheter was introduced into this abnormal opening and it entered uninterrupted for 2½ inches. Some indigo-carmine was injected down this ureteric catheter and immediately it appeared at the navel. Some Diodrast was also injected and radiographs were taken. This confirmed the presence of a passage going from the bladder to the umbilicus. In view of the pus cells in the urine and the irritated condition of the umbilicus, the patient was put on antibiotics to prepare him for the operative removal of the patent urachus. After two days of antibiotics, the patient complained of severe pain at the umbilicus; this persisted for several hours and was immediately relieved when he passed through his umbilicus an oval-shaped calculus measuring 0.5 cm. x 1.5 cm. The flow from the umbilicus then became much greater. Two days later the patient was operated on. At operation a distinct patent urachus was found—the diameter at the bladder end being about 1 cm., gradually tapering to 0.5 cm. at the umbilical end. There was a dilated area near the umbilical end where the calculus had obviously been. The patent urachus was dissected out *in toto*, down to the bladder wall and removed. The abdominal wound was closed and an indwelling catheter left in the bladder. The patient took the operation quite well. His postoperative recovery was uneventful and he was discharged from hospital in 14 days.

SUMMARY

A case of patent urachus is described. This case was unusual in that the urachus contained a calculus, the patient was a young man, and before this attack he had never before shown any signs or symptoms of the condition.

I am grateful to Wing Commander Munroe, Senior Medical Officer, Royal Canadian Air Force Hospital, Cold Lake, for permission to publish this case.

*Royal Canadian Air Force Hospital, Cold Lake, Alta.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

Special Article

THE RETURN OF THE DEFECTIVE TO THE COMMUNITY

ROBERT GIBSON, M.D., D.P.M.,*
Portage la Prairie, Man.

THERE IS LITTLE DOUBT that in recent years the public has become increasingly aware of the number of mental defectives in its midst, and whilst the tendency has been to stress their removal the emphasis on segregation has rather obscured the fact that they may also return to the community. The extent to which this occurs depends on local factors which are subject to wide variation. Where, for example, the defectives are potential wage-earners their adequate rehabilitation presupposes the existence of suitable employment, as well as labour conditions which enable them to compete for such work. Other factors which are equally necessary for a successful outcome are a highly developed social conscience with regard to the employment and after-care of defectives, and an appropriate organization to look after their interests. These are conditions which take a considerable time to mature and for this reason are likely to be more advanced in older countries which have had a relatively long period of time in which to build up their social services.

Generally speaking, several courses of action are possible for defectives who are considered suitable to return to life in the wider sphere. They may simply be discharged outright from the mental deficiency institution and returned directly to their own homes, although this is exceptional. As a rule some form of continued supervision is adopted, its nature and duration depending on individual defectives. Some defectives who are relatively stabilized and socialized still remain in need of more or less permanent care and supervision. Here family care may be recommended, combined preferably with attendance at a senior occupational centre. For others who may be capable of supporting themselves the requisite link between institution and community life is provided by intermediary hostels.

Family care may be of the dispersion, annex or colony type, depending on local conditions. In the dispersion system traditional in Scotland patients are placed in private homes, preferably in the country. Their supervision then rests with officials of the central body administering the Mental Deficiency Acts, the General Board of Control, and with officers of the local health authority in whose area they happen to find themselves. The annex system characteristic of England differs from this inasmuch as the parent institution assumes responsibility and arranges supervision directly by means of its social workers, as often as not providing domiciliary occupational therapy. In the colony system of family care the placing of defectives is concentrated amongst families in one locality. The most outstanding example is the well-known centre at Gheel in Belgium where at one time as many as 4000 cases were lodged locally with private families. A system of this sort has the obvious advantage of furnishing the maximum social life for its members.

Many of the patients considered suitable for family care are likely to benefit from regular occupational training in order to prevent deterioration, ensure an acceptable use of leisure time, and maintain good social habits. Patients within reach of the larger centres can attend senior occupational centres[1] which have been set up for defectives over the age of 16 years. Attendance at such centres during most of the day has the additional advantage of making it easier for relatives to assume responsibility for their care. Depending on the qualifications of the staff, accommodation and equipment available, training is given in such varied crafts as simple woodwork, rug-making, cane and raffia work, embroidery and simple garment-making and repair. Sometimes gainful employment may follow, but with defectives of the type usually attending such centres employment is apt to be of a very temporary nature. In any case this is not the main function of the centre.

The position is quite different with patients who show promise of being partially or fully self-supporting. In some instances they may be sent straight into the community, although they remain under licence from the institution and may be recalled at any time in the event of difficulties arising. However, an intervening period in a hostel is desirable to ensure a smoother transition to full community life. The hostel system includes domestic, agricultural and industrial types. They supply the requisite needs not only in facilitating adjustment to the community but equally in protecting the community itself from the consequences of unforseen break-down. Amongst other assets hostels make possible a greater degree of freedom, a graduated assumption of responsibility, and a more practical experience of the value of money. Moreover, defectives who have shown the necessary capacity and stability to benefit from the hostel system are perhaps more likely to find employment in an increasingly competitive world. This was less of a problem in earlier days when a considerable range of simple crafts provided steady and secure employment for the subnormal. With the increase of mechanisation in most fields the opportunity for work previously carried out by defectives has steadily diminished. And now the coming of automation

*Clinical Director, Manitoba School, Portage la Prairie, Manitoba.

can hardly fail to add further complication. When, for instance, one electronic computer is capable of replacing, with less expense and greater accuracy, no fewer than 600 full-time clerks[2] the threat to the subnormal assumes a more concrete form. Since the economic value of defectives is highest under conditions of full employment, they are likely to be amongst the first to feel the impact of any general unemployment. Even in a complex world, however, there may possibly remain some simple routine tasks, within the competence of the subnormal, for which electronic devices would be unsuitable or uneconomic!

The general principles of a hostel are well exemplified in the domestic variety. From the centrally placed hostel with its trained staff, girls go out daily to domestic work which has been specially chosen for the sympathy and understanding of the employer, the scope of domestic training, and the adequacy of supervision and company. Of the money earned part is usually paid into individual bank-accounts, each girl having the opportunity of saving up and buying herself clothes and other requisites and so learning the value of money in the most practical way. After a period of satisfactory adjustment restrictions may be further reduced. Eventually the most satisfactory cases may graduate entirely from the hostel, their social needs being most appropriately met by clubs for such girls. Domestic employment is one of the most promising spheres, for whatever may be the impact of automation on unskilled labour generally it is likely to be a long time before domestic helpers are replaced by robots. The openings therefore for this type of work are perhaps in less danger of diminishing than may be the case with other fields of endeavour for the defective. For male defectives agricultural and industrial hostels serve the corresponding needs. Boys who have received their training on the institution farm can be sent to agricultural hostels for work on neighbouring farms, or they may be sent to farm training hostels for more intensive instruction. An outstanding example of the latter is the Todhill Farm Training Colony in Scotland which admits suitable lads from any of the Scottish mental deficiency institutions. There they receive an intensive course in the methods and types of work likely to be encountered in the farms they will later be sent out to work on. From this centre they may be placed subsequently in suitable farms where their continued well-being is safeguarded by visits from officials of the General Board of Control.

In the case of boys who have been trained in the workshops the change-over to an industrial environment may be eased through the industrial hostel, from which the most suitable lads can go to the simpler routine jobs in neighbouring industry whilst others may perhaps be accommodated in sheltered workshops. The placing of defectives in industry is accompanied by its own peculiar hazards. Once suitable employment has been found, there arises the need to ensure that the employer understands the defective's shortcomings, such as his slowness in learning and working, his inability to use complicated machinery, his faulty judgment and general need of closer supervision. Then there is the reaction of fellow employees who are apt to use the defective's naivety as a butt for their wit, with consequent unhappiness and maladjustment. It is therefore necessary to prepare the defective well in advance for the conditions he is likely to encounter.

In preparing defectives for future employment, training is essentially for unskilled work. Since this is the lot of a substantial part of the adult labour force, it is clear that defectives will require to compete with non-defectives for unskilled work. Even at this level they are at a disadvantage because of their poor adaptability and slow learning speed. To give them the best chance of competing with their intellectual superiors the requisite measures are provision of intensive training for low-level jobs, inculcation of the social skills needed to hold down the job, and a system of vocational placement and after-care.

The choice of employment is determined by training facilities, local prospects and the patient's level of ability. In general, suitable vacancies may be found in woodwork, packing, and the unskilled work available in local activities. The development of sufficient social skill contributes much to success, for a considerable number of jobs are lost not through lack of manual dexterity but for such reasons as improvidence or failure to get on with fellow-workers. In common with other handicapped groups, mental defectives in Britain are eligible for registration under the Disabled Persons (Employment) Act of 1944. This applies to defectives from special schools and mental deficiency institutions, as well as adult cases referred for the first time by welfare, employment or other agencies. Admission to the register makes them eligible for certain types of work reserved for the disabled, offers the assistance of disablement resettlement officers to help in finding suitable work, and provides training if required.

Where a suitable adjustment to community life has taken place, much may be done to ensure success by provision of adequate follow-up and after-care, for without continual guidance changing circumstances may still involve the mentally limited in social, economic or moral difficulties. Valuable assistance is rendered here by members of voluntary mental health associations and the staff of mental deficiency clinics. The aim of local voluntary associations is to supply such adequate after-care services as social clubs, library facilities and holiday homes.

Apart from this the members of these organizations may arrange visitations for the instruction of the homebound. Another medium of value is afforded by mental deficiency clinics. These are specialized clinics which deal with the varied aspects of mental deficiency. Not least important is the function they perform in keeping defectives within the community, either by advising against institutionalization in the first instance, or, in the case of those who have left an institution, by investigating and treating the causes of any upset which threatens their stability. They can help in other ways as well. In the type, for example, evolved in the Scottish Eastern Hospital Region[3] a pooling of information results from that close collaboration between hospital and health and welfare staff which is the keynote of the system. Thus a wider and more informed view of the defective's future becomes possible, whilst at the same time a further association with officials of the Ministry of Labour helps to smooth out difficulties arising in the course of employment. In all cases, no matter what the means adopted, the final aim is the acceptance by the community of stabilized, socialized and vocationally rehabilitated individuals.

REFERENCES

1. Senior Occupational Centres, Scottish Association for Mental Health, Edinburgh, 1956.
2. Automation: A report on the technical trends and their impact on management and labour, Her Majesty's Stationery Office, London, 1956.
3. GIBSON, R.: The development and functions of a mental deficiency clinic system. Health Bulletin, Department of Health for Scotland, 10: 1, 1952.

SHORT COMMUNICATIONS

CLINICAL EVALUATION OF A NEW ANTITUSSIVE AGENT*

S. J. SHANE, M.D.,† T. K. KRZYSKI, M.B., Ch.B., and S. E. COPP, M.D.,‡
With the technical assistance of
RUTH MacLEOD, R.N. and
ANN NICOL, R.N., *Sydney, N.S.*

FOR MANY YEARS, opium derivatives have been the agents of choice in the therapeutic suppression of the cough reflex, and, among these, codeine in an average dose of 30 mg. has been looked upon as the standard antitussive agent in adults. From time to time, however, other cough suppressants have appeared on the market, have met with varying degrees of success and have finally disappeared from the pharmacopœia. It is safe to say that no antitussive agent has been found to date that will equal or surpass codeine, dose for dose, in efficacy and simplicity.

In recent months, however, we were requested by a pharmaceutical company to carry out a study of the antitussive effect of a new non-narcotic cough sedative. This agent is designated by the manufacturer as Tessalon,§ and has the following formula:

The accurate evaluation of an antitussive agent has always presented special difficulties. Firstly, if patients chosen for study already have a chronic cough, or an acute respiratory infection, it is difficult to state whether any diminution of cough has been the result of treatment or whether it would have occurred in the natural course of events. Secondly, the factor of suggestion enters into the assessment of results, particularly as it applies to the patient, but also, though to a lesser extent, to the physician. Thirdly, the method of assessment is important. One might, for example, choose as a study group patients who are undergoing some mechanical irritative procedure involving the tracheobronchial tree such as bronchography or bronchoscopy. It is the opinion of the writers, however (and this was brought out very forcibly in our trials), that no antitussive agent in moderate dosage is proof against actual mechanical or chemical irritation of the tracheobronchial tree. In any case, the basic reason for evaluating any antitussive agent is not to assess its effect under such bizarre circumstances, but to determine whether or not it will suppress cough of a less violent nature, such as is usual in acute or chronic respiratory infections. From the above, it is quite clear that two basic problems must be solved in any such study: (a) Any subjective considerations that might distort the final results must be excluded, and (b) Drastic mechanical or manipulative procedures in the upper respiratory tract must be avoided.

MATERIAL AND METHODS

Both these conditions were admirably met by our final decision to study the suppressive action of Tessalon on induced cough, using a citric acid aerosol as the cough-producing agent—a method devised by Bickerman and Barach[1] in 1954. This was ideal for our purposes because of the proven uniform and consistent response of the test subjects to the same threshold of stimulating agent; the reproducibility of the results in the same and different individuals

*From the Point Edward Hospital.
†Present address: Department of Medicine, Dalhousie University, Halifax, N.S.
‡Present address: Cedarcrest, Newington, Conn., U.S.A.
§The Tessalon for this study was kindly supplied by the Ciba Company of Canada.

TABLE I.—STUDY OF SUPPRESSIVE ACTION OF TESSALON AS COMPARED WITH CODEINE

Name	*Citric acid 15% without sedation* — Number of coughs 1	2	3	Average	*Citric acid 15% 1 hour following codeine grain ½* — Number of coughs 1	2	3	Average	*Citric acid 15% 1 hour following Tessalon 100 mg.* — Number of coughs 1	2	3	Average
1. D.J.MacD.	8	5	7	6.7	8	0	6	4.7	2	0	0	0.6
2. A.R.	6	7	8	7.0	8	5	5	6.0	4	3	3	3.3
3. J.H.	5	6	8	6.3	1	3	3	2.3	1	0	0	0.3
4. J.C.	9	4	5	6.0	0	5	4	3.0	0	0	0	0.0
5. A.H.	9	7	7	7.7	10	9	0	6.3	0	0	0	0.0
6. H.B.	8	7	5	6.7	3	3	2	2.7	1	0	0	0.3
7. W.M.	8	5	6	6.3	3	3	5	3.7	0	1	5	2.0
8. M.S.	5	9	5	6.3	3	5	5	4.3	4	6	0	3.3
9. J.B.	12	7	10	9.7	3	6	6	5.0	0	0	0	0.0
10. A.MacN.	12	7	7	8.7	7	2	3	4.0	0	0	0	0.0
11. A.P.	8	13	7	9.3	9	6	8	7.7	5	4	3	4.0
12. M.O.	10	9	11	10.0	2	8	17	10.0	5	8	10	7.7
13. J.A.MacP.	12	7	6	8.3	0	0	0	0.0	0	0	0	0.0
14. M.MacA.	10	5	8	7.7	7	5	2	4.7	0	2	0	0.7
15. B.M.	8	7	8	7.7	3	6	6	5.0	3	0	0	1.0
16. E.O.	9	9	4	7.3	0	1	2	1.0	2	1	1	1.3
17. A.G.	8	6	13	9.0	6	8	5	6.3	3	3	5	3.7
18. L.S.	12	12	16	13.3	2	3	4	3.0	5	0	1	2.0
19. Mrs. MacI.	20	15	11	15.3	7	2	5	4.7	4	0	6	3.3
20. J.MacD.	7	7	5	6.3	1	0	7	2.7	0	0	3	1.0
Group average				8.0				4.7				1.7

during the course of the study; the lack of toxicity; and the simplicity of the method used to elicit cough, which made it possible for such studies to be carried out on a large number of subjects. The method used in this study was as outlined by Bickerman and Barach with the sole exception that the strength of the citric acid solution used by us was higher—15% instead of 10%. In preliminary trials we found we were able to corroborate the findings of these workers that the higher figure gave more consistent and more reproducible results, and that the number of coughs during and for a five-minute period immediately after inhalation of the aerosol could be accurately counted. This ruled out any psychologic effect on the observer or the patient or both, which might have resulted in a lack of clarity in the final result.

Twenty patients, carefully screened for the absence of any spontaneous cough, were selected for this study. Each patient received aerosol inhalations of 15% citric acid solution on three separate occasions, several days apart. A Vaponefrin nebulizing apparatus, with rebreathing bag and with oxygen as the vehicle, was used and each patient was given five successive inhalations of 15% citric acid solution on each of the three occasions. The number of coughs during and for a five-minute period immediately after inhalation of the aerosol was counted and tabulated.

After an appropriate interval (several days) the same procedure was repeated exactly, *with the exception that,* at this time, each patient was given codeine grain ½ one hour before the test procedure. This also was repeated on three occasions for each patient. Finally, again after an appropriate interval, the same procedure was repeated for a third time, *but* Tessalon, 2 perles (100 mg.), was given one hour before the test procedure, instead of codeine. The number of coughs in each case was counted by using a Veeder-Root hand tally apparatus.

RESULTS

The results of this study are clearly and strikingly illustrated in Table I. As will be seen from the table, the number of coughs in each series of three tests was averaged, and it is quite clear from these figures that codeine in doses of ½ grain (32 mg.) is capable of distinct suppression of the cough reflex as induced by 15% citric acid aerosol. It is equally clear that Tessalon in doses of 100 mg. caused more marked suppression of the cough induced by the same agent. A simple arithmetical calculation will indicate that codeine, in doses of ½ grain, decreased the frequency of the induced cough to 50% of the pre-medication figure. The same type of calculation will indicate clearly that Tessalon in a dosage of 100 mg. decreased the frequency of the induced cough to approximately 20% of its pre-medication figure. Thus it would appear that Tessalon in a dosage of 100 mg. is approximately 2½ times as effective in the suppression of induced cough as codeine in a dosage of ½ grain.

It would seem quite clear, therefore, that Tessalon in a dosage of 100 mg. is an extremely effective cough suppressant and, in this dosage, is a more potent agent than is codeine in doses of ½ grain. No additional conclusions can or should be drawn from these observations.

SUMMARY

1. The efficacy of a new antitussive agent, Tessalon, in doses of 100 mg., was compared with that of codeine, in doses of ½ gr., in 20 volunteers, in whom cough was induced by the inhalation of 15% citric acid aerosol.

2. It was found that codeine, in the dose named, decreased the frequency of induced cough to 50% of the pre-medication figure, while Tessalon, in 100 mg. doses, decreased the frequency of induced cough to 20% of its pre-medication figure. This would indicate that, in the doses stated, Tessalon is approximately 2½ times as effective in cough suppression as codeine. No undesirable side-effects resulted from the administration of Tessalon.

3. Tessalon should therefore be considered as a potent and valuable antitussive agent, for either routine or specialized use.

REFERENCE

1. BICKERMAN, H. A. AND BARACH, A. L.: *Am. J. M. Sc.*, 228: 156, 1954.

TIMED DISINTEGRATION MEDICATION—NEED FOR MORE QUANTITATIVE CRITERIA*

J. A. CAMPBELL, Ph.D.,
D. G. CHAPMAN, Ph.D. and
L. G. CHATTEN, M.Sc., *Ottawa*

IN A RECENT PAPER on timed disintegration capsules, Feinblatt and Ferguson[1] present data which ". . . attempt[s] to answer the question of comparative availability of a substance that is a non-metabolite and has varying disintegration times . . ." The approach taken in this paper towards availability of medicament appears to dismiss the use of "physiological availability", as employed by our group[2] and others,[3] and raises the question as to what is meant by or what constitutes acceptable evidence of availability and disintegration of tablets. Since the data presented by Feinblatt and Ferguson represent the three most common approaches to this subject, it was felt that some of the difficulties involved in interpreting such data might be outlined in further detail at this time. This note is not intended as a direct criticism of their paper, but is an attempt to emphasize the need for more critical work on this subject.

Physiological availability has been described by Oser and his colleagues[3] as the percentage of the drug dose excreted in the urine in 24 hours in relation to that excreted from a dose of a standard preparation. It is a quantitative measure of the amount of drug which has passed through the body by way of blood and urine. It has been found applicable to a non-metabolite[2] as well as to metabolites. Data from such tests can be quantitatively related to response to a standard preparation. While the work of Feinblatt and Ferguson is an attempt to study disintegration and availability of timed disintegrating products, it presents no data determined by Oser's criterion[3] of physiological availability and does not lend itself to quantitative considerations or definite conclusions.

In discussing their *in vivo* x-ray studies[1, 4] the authors repeatedly state that the x-ray studies showed that the medication was available. As has been pointed out by Oser and associates,[3] x-ray studies can demonstrate disintegration within certain limits but cannot be used as a valid indication of availability. It is known, for example, that thiamine may combine with certain adsorbents in such a way that it cannot be fully utilized by the body. Disintegration, therefore, may not always mean availability. Even to demonstrate disintegration, x-ray studies have their limitations and the results of such studies are not amenable to quantitative analysis.

Blood level studies such as those reported by Feinblatt and Ferguson[1] cannot be treated on a quantitative basis. It would seem of prime importance to report the actual blood levels of drug found at each time interval, along with some measure of the variation between subjects. Since "comparative availability" is being studied, it would seem necessary to use adequate standards, with which products of varying disintegration times might be compared. Furthermore, blood levels at various times cannot be quantitatively related to drug unless some criterion such as the area under the blood level curves is used. These authors have not done this.

Clinical responses such as pain control are often difficult to interpret quantitatively. Control groups should always be tested to ensure that the responses obtained are a result of the medication. If possible, responses should be quantitatively measured in some manner and compared with those on an appropriate standard preparation. Even when these precautions are taken, clinical responses may not necessarily be an indication of complete physiological availability.[3] This fact, of course, does not lessen in any way the need for such clinical data which is most useful for physicians in judging the over-all effectiveness of the drug, but it does limit its usefulness as a criterion of availability.

In any study of timed disintegration medication it is most desirable that some means of determining disintegration *in vitro* be correlated with quantitative *in vivo* techniques so that there will be valid methods for pharmaceutical control.

*From the Food and Drug Laboratories, Department of National Health and Welfare, Ottawa.

In the light of the above comments, it seems clear that physiological availability as judged by urinary excretion remains probably the best criterion of time of disintegration *in vivo*, and of rate and amount of drug availability. It is hoped that future studies of timed disintegration medication will include such data along with any other which might be considered necessary and which may be related quantitatively to dose.

REFERENCES

1. FEINBLATT, T. M. AND FERGUSON, E. A., JR.: *New England J. Med.*, 256: 331, 1957.
2. CHAPMAN, D. G., CHATTEN, L. G. AND CAMPBELL, J. A.: *Canad. M. A. J.*, 76: 102, 1957.
3. OSER, B. L., MELNICK, D. AND HOCHBERG, M.: *Indust. Eng. Chem., Annal. Ed.*, 17: 405, 1945.
4. FEINBLATT, T. M. AND FERGUSON, E. A., JR.: *New England J. Med.*, 254: 940, 1956.

TREATMENT OF SUBUNGUAL HÆMATOMA

G. M. BEALL, M.D., *Saskatoon, Sask.*

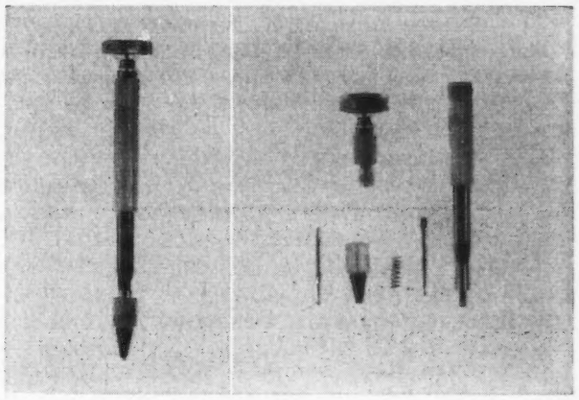
TREATMENT of the painful subungual hæmatoma has been anything but standardized over the years. The many varied suggestions offered in the literature confirm the lack of a satisfactory method of dealing with this common condition.

Cozen[1] claims that drilling the nail is too painful and recommends the tedious process of "nail scraping." McElmoyle[2] suggests the equally tedious method of "cuticle elevation".

We have devised an instrument for the rapid, painless drilling of the nail body. This instrument has been used successfully without complaint in the treatment of 30 cases of subungual hæmatoma over the past five months.

The instrument (Fig. 1a and 1b) is made in the form of a watchmaker's screw driver and is about 10 cm. in over-all length. The drill is a twist type with a choice of two diameters of drill which are contained in the upper part of the handle of the instrument when not in use. An adjustable guard permits regulation of the depth of penetration of the drill, depending upon the thickness of the nail body to be drilled. Thus, the painful accidental penetration of the sensitive nail matrix can be avoided.

When employing this drill, it is first essential to mark an "X" on the surface of the nail at the desired site of puncture, using an ampoule file. This will prevent the drill from sliding or drifting when first applied to the surface of the nail. After the customary antiseptic precautions have been observed, the drill is gently applied on the site of intersection of the file marks. With very light pressure at right angles to the nail surface and rotation of the handle of the drill between the thumb and second finger, a clear-cut, non-clogging hole is made in the nail body which will permit the free escape of the restrained hæmatoma. Application of a "band aid" with slight pressure will usually control any bleeding.



(a) (b)

Fig. 1

SUMMARY

Treatment of the common, painful subungual hæmatoma has been simplified by the use of the Beall nail drill, as described.

1101 Monroe Ave.

REFERENCES

1. COZEN, L.: Office orthopedics, 2nd ed., Lea & Febiger, Philadelphia, 1953, p. 166.
2. MCELMOYLE, W. A.: *Canad. M. A. J.*, 75: 593, 1956.

DIET AND ATHEROSCLEROSIS

"One of the major problems under discussion is whether there has been a marked change in the American diet during the past generations—the period in which the incidence of coronary heart disease and atherosclerosis is said to have increased.

"Many of the conclusions that have been reached are subject to very basic criticism. It is very important that physicians realize that the urgency of the situation does not permit the disruption of a sound and orderly attack on the problem by undue emotionalism and competitiveness among the investigators. Altering the dietary habits of a large population group is fraught with a great many dangers. Our knowledge of nutrition is not sufficient at this time to anticipate what ultimate results would happen if the public were encouraged to alter radically their basic dietary patterns."—H. Pollack, *Circulation*. 16: 161, 1957 (E).

Canad. M. A. J.
Sept. 15, 1957, vol. 77

The Canadian Medical Association Journal

published twice a month by
THE CANADIAN MEDICAL ASSOCIATION
Editor: S. S. B. GILDER, T.D., M.B., B.Sc.
Managing Editor: T. C. ROUTLEY, M.D., F.R.C.P.[C.]
Assistant Editor: M. R. DUFRESNE, M.D.
Editorial Offices: 150 ST. GEORGE ST., TORONTO
(Information regarding contributions and advertising will be found on the second page following the reading material.)

VARIABLES IN HEALTH INSURANCE

In pre-war days, someone wrote a detective story called "They wouldn't be chessmen", in which the complexities of the plot stemmed from the fact that the characters persisted in behaving like human beings instead of chessmen. This sort of thing introduces one uncontrollable variable in health insurance. "Disease, gentlemen, does not play the game," said Sir Robert Hutchison. Here is another uncontrollable variable. We are reminded of these two variables in reading some thoughts on the future of health insurance in France, expressed by Dr. J. R. Debray in a lecture to the Academy of Moral and Political Sciences in Paris this spring.* His theme had reference to the proposed national health insurance scheme which has caused great alarm among the French medical profession this year. Since the French nation is mainly composed of independent variables, the introduction of a uniform health insurance plan there is likely to encounter extraordinary difficulties. Nevertheless, many of the points made by Debray are valid outside France, and worth thinking over once again.

He notes that health insurance is often not an "insurance" scheme but an "assistance" scheme; in real insurance, the premiums must balance the benefits, otherwise the scheme is bankrupt. In state insurance schemes there is often no balanced budget; the state covers its losses out of general taxation. For humanitarian reasons it is not possible to exclude high-risk individuals, in the way that accident-prone motor drivers are refused auto insurance. And, with the enormous progress in medicine in the last decade, it is very hard to set a budget based on past experience of sickness. Indeed it would have been far easier for actuaries to introduce a health insurance scheme fifty years ago, when a decade of medical progress produced practically no change in the volume of medical care, than it is now in this era of rapid changes in therapy.

Debray fears that the actuaries and financial experts are not sufficiently aware of this; social security organizations, he says, have been developed exclusively on financial and actuarial lines, with disastrous results. As evidence of the difficulties of formulating a national comprehensive health insurance plan, he points to the fact that the United States, the richest country in the world, has failed so far to come up with a satisfactory solution to this basic social problem. What is needed is not an adaptation of medicine to insurance, but an adaptation of the principles of insurance to medicine.

This implies a realization that neither patient nor physician is a robot. Bürger remarked that every diagnosis has two faces, like Janus, one looking towards medical technology and one towards a knowledge of the human personality. If the field of vision of the former face is used exclusively, the physician will become an automaton, and as such easier to handle in terms of statistics and finance, though his assembly-line medicine represents a caricature of the healing art.

The adaptation of insurance to medicine also implies a really large measure of control and self-discipline by the medical profession, a philosophy unpalatable to social security "experts" in Europe at least. Yet, as Debray shows, only the profession can produce the basic studies necessary in each specialty to solve the problems of insurance applied for example to psychosomatic disease, and to keep the insurance system in step with advances in medicine.

In other branches of insurance, the onus for the prevention of abuse lies on the insurer, but in health insurance this is no longer a practical concept. The control of the scheme depends on the medical profession and the individual members. There are those who consider that the imposition of rigid control by an outside body

**Médecine de France,* No. 83, p. 5, 1957.

will bring satisfactory results, but unfortunately experience suggests that this will maintain neither a high moral nor a high scientific level in medicine.

Lastly, Debray attacks the government proposal to create several classes of physician in France. At the top will be the "hundred greatest physicians" in France, who will have the privilege of charging what they like—but their patients will have to pay the bills themselves. Then will come the "upper-class" fifteen per cent of the profession who can charge according to a first-class tariff, with repayment by the health insurance, followed by the rank and file of physicians at second-class rates. This concept of first-class hospital doctors and second-class general practitioners, current in Britain and Italy, has been accepted by some as the ideal in modern medicine, but Debray suggests that it is already out of date. Modern medicine has put into the hands of the general practitioner potent weapons for the first time in history and he should be encouraged to use them and not, as in Russia, to take his place as low man on the totem pole in the type of hierarchy traditionally dear to the Russian mind.

It should be noted that after Debray's address, the Academy adopted a number of resolutions on health insurance, expressing the hope that any new plan would maintain the liberal and humane tradition of the medical profession, would abstain from lowering the quality of medical care by dividing the profession into classes, would take into account in its budget *all* the problems of France and not just its medical problems, would profit by experience of national health insurance schemes elsewhere, and would encourage the continuation of medical research. To all these hopes we can only say "Amen".

Editorial Comments

LEUKÆMIA

As the infectious diseases and the deficiency states have come to some extent under control, the interest of the public and of the profession has been increasingly occupied by the neoplastic and degenerative diseases. Of these none is more dramatic or has captured more of the public sympathy than the group of malignant and mysterious disorders lumped under the title of leukæmia. A review of the clinical and therapeutic aspects of this subject is undertaken by Dr. Ronald Bodley Scott in the Lettsomian lectures for 1957.[1] Dr. Scott sets forth in concise and pungent style a distillation of his experience with 570 cases, and a brief appraisal of the pertinent literature.

It seems evident that improved reporting, more accurate diagnostic methods and enhanced interest cannot account for the observed increase in the incidence of all forms of leukæmia. This is of such proportion as to have been surpassed only by carcinoma of the lung and coronary thrombosis. In England and Wales there has been an almost threefold increase in reported cases between 1931 and 1955.[2] Now the only causative agent known to have any great importance for human beings is ionizing radiation. It is tempting to relate the increased incidence of leukæmia to the evolution of x-ray techniques in medicine and industry. The evidence derived from the study of survivors in Hiroshima and Nagasaki,[3] the observations on cases of Marie-Strümpell spondylitis treated by irradiation of the spine,[4] the follow-up of children irradiated for thymic enlargement[5] and the correlation of juvenile leukæmia to pelvimetry of the mother[6] have provided impressive data as to irradiation effects in man. Studies are in progress attempting to correlate exposure to diagnostic radiation with the incidence of leukæmia. Whatever these latter studies show, it is likely that the public and the profession will be rendered more conscious of the hazards of radiation and that this will lead to a re-evaluation of many procedures including repeated examinations of a sort which deliver high doses, shoe fitting by x-ray, unnecessary fluoroscopic procedures under unfavourable circumstances and therapeutic irradiation of benign lesions.

The classification of acute leukæmia continues to present difficult problems. Dr. Scott has compared the distribution of cases among the three categories according to several different authors. The extent of the discrepancy probably reflects differences in the criteria of hæmatologists rather than any actual difference in the distribution of the various types of acute leukæmia in different populations. It appears that further advances in this field will not be made by using morphologic criteria alone, but will depend on the development of new methods aimed at detecting metabolic relationships between cells. It is perhaps not surprising that hæmatologists have found difficulty in categorizing cells which are not only immature but abnormal. That a distinction may be of more than academic interest is indicated by several reports that show differences in the response of patients to treatment depending on the type of cell involved.[7]

Canad. M. A. J.
Sept. 15, 1957, vol. 77

The concept of a basic unity among polycythæmia vera, chronic granulocytic leukæmia, essential thrombocytosis, myelosclerosis and other less well defined and more variable syndromes has promoted understanding of these conditions. In this instance, however, much more so than in acute leukæmia, enough clinical differences exist which have a definite bearing on the choice of therapy that it remains worth while to categorize each case as accurately as possible. It appears then that an increasingly large number of cases of chronic granulocytic leukæmia, 59% in Dr. Scott's series, are terminating as myeloblastic leukæmia. It is still a moot point whether this transformation is accelerated by treatment of the chronic state with drugs or radiation. Cases of polycythæmia vera terminating in this manner are also becoming more frequent.

The years since the war have seen the introduction of a number of chemotherapeutic agents which have proven themselves capable of producing remission, although not cure, in a significant number of patients and which possess considerable specificity in respect to the type of leukæmia. These agents are, of course, the only "specific" treatment for acute leukæmia and in the treatment of chronic leukæmia they are tending to replace radiation, which for years had held an undisputed position in the field. Many clinics now begin treatment of chronic granulocytic leukæmia with 1-4-dimethanesulfoxybutane (Myleran), as Dr. Scott does, and of chronic lymphocytic leukæmia with chlorambucil or triethylene melamine. In general the results with drugs and with radiation are of the same order and the choice is dictated by convenience. In Canada, where many live in areas remote from large centres, periodic visits for x-radiation to the spleen or or for administration of P^{32} may be preferable to precarious control by inexperienced persons with poor laboratory facilities. Shrinkage of lymphoid tissue may often be better accomplished by x-ray than by other means, even though important relief of anæmia and thrombocytopenia is not achieved. Where no treatment is curative, it is probably as well not to abandon completely any agent which may afford relief to some of the patients some of the time.

Despite the apparent advances in treatment, the many new drugs, the antibiotics and the free use of blood transfusions, the mortality statistics give little cause for self-satisfaction or complacency. Dr. Scott's figures can be taken as representative of the kind of results to be obtained in the various types of leukæmia. Mortality curves of cases treated only with blood transfusions or after no treatment at all are almost identical. This will come as a surprise to some who have treated cases and procured a "complete remission" with return to apparent well-being and reversion of hæmatological findings to normal. The impression from such cases is that therapy has indeed prolonged life. Yet in Dr. Scott's 63 cases of acute leukæmia treated with specific agents the mean survival was 21.7 weeks whereas in a series of 81 patients treated only with blood and antibiotics the mean survival was 20.2 weeks. It would be difficult, therefore, to justify a vehement plea that all cases of leukæmia, acute and chronic, should be treated with specific agents, were it not that the story of treatment is not wholly contained in the figures for survival. There seems to be no doubt in the minds of those who treat large numbers of these patients that treatment is valuable in diminishing morbidity, increasing comfort and bringing some measure of happiness to the patient's last months. This is perhaps most evident in chronic granulocytic leukæmia where one can almost count on a clinical and hæmatologic remission which may transform months of invalidism into long periods of apparent good health. Dr. Scott states that his figures for acute leukæmia give "no cause for optimism, but we have at present six patients in complete remission".

Dr. Scott has painted a gloomy picture of leukæmia, and indeed there is little occasion for optimism. He sees some hope in the recent exciting developments in experimental leukæmia in which massive total body irradiation is followed by transplantation of homologous or even heterologous marrow.[8] In mice it is possible apparently to eradicate leukæmia and repopulate the bone marrow with normal cells. The future of these studies will be observed with interest.

REFERENCES

1. BODLEY, SCOTT R.: *Lancet*, 1: 1053 *et seq.*, 1957.
2. HEWITT, D.: *Brit. J. Prev. & Social M.*, 9: 81, 1955.
3. MOLONEY, W. C. AND KASTENBAUM, M. A.: *Science*, 121: 308, 1955.
4. COURT BROWN, W. M. AND ABBATT, J. D.: *Lancet*, 1: 1283, 1955.
5. SIMPSON, C. L., HEMPELMAN, L. H. AND FULLEN, L. M.: *Radiology*, 64: 840, 1955.
6. STEWART, A. *et al.*: *Lancet*, 2: 447, 1956.
7. WINTROBE, M. M. *et al.*: *Ann. Int. Med.*, 41: 447, 1954.
8. BARNES, D. W. H. *et al.*: *Brit. M. J.*, 2: 626, 1956.

CIGARETTE SMOKING

The increasing incidence of cancer of the lungs has been observed now for several years. The concern over this rise has prompted a great deal of research and the causes involved are gradually emerging from darkness. Two recently published contributions[1,2] shed a good deal of light on the matter. They originate from such authoritative sources that one cannot afford to ignore them. One of them based its conclusions on 16 studies carried out in five different countries during the past 18 years, and comes to the conclusion that there is a "statistical association between smoking and the appearance of lung cancer" of the epidermoid or undifferentiated type. Demographic studies show that the incidence of carcinoma of lung in smokers

is between 5 and 15 times that encountered in non-smokers; other sources quote that the death rate among heavy smokers is 40 times that of non-smokers. This increased incidence in lung carcinoma is proportional to the intensity and the duration of the smoking habit, and is mostly applicable to cigarette smokers rather than pipe smokers.

At the present stage of the survey, it is difficult to draw the line between a light and a heavy smoker. Yet some workers claim that 1 in 10 persons who smoke two packages a day during their lifetime will die of lung cancer, as opposed to the incidence in the general population of non-smokers, which is 1 in 275. Although the threshold of danger is probably variable, due to a number of individual factors, it has been estimated at half a pack per day. Carcinogenic substances have been isolated from cigarette smoke and tobacco tars. The deep inhalation associated with the act of smoking draws the smoke, which is usually in the form of minute oily droplets, deep down into the respiratory tree. The repeated application on the skin of experimental animals of concentrated cigarette smoke has given rise in a number of instances to neoplasm. In order to secure a more obvious type of demonstration, certain workers have advocated the use of human volunteers who could be followed up over the years, until they reached the autopsy table. Histological examination of biopsies from the mouth and larynx of smokers revealed the presence of basal cell hyperplasia, atypical hyperplasia, squamous metaplasia and even carcinoma *in situ*, more frequently than they have been seen in non-smokers. That these changes cannot be blamed on occupational hazards comes from the fact that they have been encountered in subjects coming from all walks of life. The outlook is made even more gloomy by the observation that alcohol consumption increases the smokers' susceptibility to laryngeal cancer.

This problem is assuming such proportions as to become one of public health concern, particularly since there is no sign that a peak has been reached in the constantly rising death rate from lung cancer. Whatever measures are adopted will have to be far-reaching, since cigarette smoking is not the only cause of such an increase. Although playing a minor part, air pollution as found in the larger urban centres has also been incriminated (the death rate from lung cancer in non-smokers is higher in cities than in the country). The passing of regulations to curb or even prevent the use of cigarettes is obviously utopic. Such matters hardly lend themselves to the powers of legislation. (One only has to remember the restrictions on the sale of alcoholic beverages enforced in some provinces and which have obviously not curbed the number of alcoholics in the same areas.) It would also be a very arduous undertaking to deprive the people of such a source of pleasure and the Government of such a source of income. As the Editors of the *Lancet*[3] were rightly suggesting, the approach to the problem should be an attempt to modify the social habits of the younger generation. Enlisting the powers of persuasion of television, cinema and radio might prove the proper means. Yet this could still be a futile effort, since the ways of "teen-agers" are unpredictable and the factors which enter into play in shaping their mentality, even if understood, might not easily be manipulated. The control of atmospheric pollutions such as coal smoke and the exhaust fumes from incomplete combustion of petrol or diesel fuel is under way in many large urban centres. Should cigarette smoking ever go out of fashion, it would be interesting to watch not only the expected decline in incidence of carcinoma of the lungs, but also what influence its disappearance would have on such other diseases as asthma, bronchitis, tuberculosis, thromboangiitis obliterans and cardiovascular heart disease.

REFERENCES

1. Joint Report of the Study Group on Smoking and Health: *Science*, 125: 1129, 1957.
2. Cancer of the Lung—Recent Knowledge of Causative Factors. Report of the Medical Research Council for the Year 1955-56, pp. 10-15.
3. Editorial: *Lancet*, 2: 1345, 1957.

FLUOTHANE

Almost the whole of the July issue of the *Canadian Anæsthetists' Society Journal* is devoted to studies in Canada and the United States of the newly developed fluorinated hydrocarbon, Fluothane, a volatile anæsthetic first investigated in Britain. Fluothane is 2-bromo-2-chloro-1,1,1-trifluoroethane. It was studied during a search for a non-explosive and non-inflammable anæsthetic agent possessing none of the disadvantages associated with chloroform, trichlorethylene and nitrous oxide. It is a clear, colourless liquid with a rather pleasant odour, non-inflammable, non-explosive, and stable in the presence of soda lime. It can be used by drop bottle like chloroform and ether, and might be employed in this way in a situation where there were mass casualties and insufficient stocks of anæsthetic apparatus. It would seem, however, from the studies reported that it is best used in a semi-closed circuit. MacKay of Toronto has developed a new continuous-flow non-rebreathing circuit (nitrous oxide and oxygen) with a temperature-compensated vaporizer capable of delivering accurately the low concentrations of Fluothane required for induction and maintenance. This apparatus has been patented as the Fluotec.

It seems clear from the studies reported in the Canadian journal that this anæsthetic is not for the occasional anæsthetist. It requires careful and accurate administration, and in particular avoid-

Canad. M. A. J.
Sept. 15, 1957, vol. 77

ance of abrupt changes of concentration. The latter may cause a rapid drop in blood pressure with cardiovascular depression, respiratory depression and cardiac arrhythmias. Moreover, Fluothane is incompatible with epinephrine and norepinephrine.

Induction has been either by thiopentone, continued by gas and oxygen with addition of Fluothane, or by gas and oxygen and Fluothane alone.

Advantages of the new anæsthetic are that it does not cause respiratory irritation, bronchoconstriction or laryngospasm. It appears also to reduce capillary bleeding and it permits good control of respiration. Hudon of Quebec City thinks that it combats shock and also that it has a tranquillizing effect on the patient after operation. The authorities are agreed that postoperative vomiting is rare, but note that the drug produces only moderate relaxation. It has been employed successfully in pædiatrics and in neurosurgery. Chang and his colleagues from Vancouver think that it will be used mostly in neurosurgery, plastic and radical surgery, and cases with an explosion hazard.

THE FAMILY TREE

In an address given to the Massachusetts Medical Society in Boston on May 21, Dr. Paul Dudley White makes an earnest plea on behalf of a new use for old family trees (*New England J. Med.*, 256: 965, 1957). In taking medical histories, says Dr. White, we do not pay sufficient attention to the factor of heredity. Very little effort has as yet been made to select from the whole mass of mankind those individuals who by virtue of their genetic make-up are candidates for particular diseases. If we could pick these people out, we could engage in limited campaigns in preventive medicine with the assurance that the effort involved would be well expended. Many of the diseases which, with the extinction of the great scourges, now stand revealed as enemies of modern society, such as hypertension and coronary disease, must surely have a genetic factor in their etiology.

Dr. White quotes publications in which the familial occurrence of congenital heart disease has been recorded. He also reminds us that about 5% of the inhabitants of almost any given community react to hæmolytic streptococcal infection with a chain reaction leading to rheumatic fever in the course of two weeks. This sensitivity runs in families. The relative responsibility of genetic factors in hypertension and hypertensive heart disease is still not determined, but we know that, for instance, serious hypertension may run in some families, while in others the systolic pressure may be above what is considered normal but this may do no harm. Furthermore, a family may contain a number of persons who over-react to stresses with a very labile blood pressure, either normal or elevated.

Ancestry also plays a part in coronary artery disease. A study by Dr. White showed that adults under 40 with a history of coronary artery disease tended to have fathers who had died of this condition. Dr. White summarizes his recommendations by making a plea for the training of many more human geneticists to help physicians in practice and research. Families should be urged to record, as they did in days gone by, their family trees with ages of death and causes of death of all members of the family. Obviously this implies an increased incidence of autopsies. Practising physicians should be asked to record the ages, the causes of death, and the state of health of parents, grandparents and siblings of patients. This knowledge is badly needed as a basis for research into the heredity of disease and as a further step towards a rational system of prevention, begun in time to save the lives of younger members of families susceptible to serious disease.

CANADIAN JOURNAL OF SURGERY

By the time you receive this copy of your Journal, the first issue of the new quarterly *Canadian Journal of Surgery* will be at the printers.

We think that it contains a worth-while selection of contributions from surgeons across Canada, and that it is the forerunner of many good things to come. If you are interested in surgery and have not as yet subscribed, send ten dollars to the *Canadian Journal of Surgery*, C.M.A. House, 150 St. George Street, Toronto 5, Ont., and we will see that your subscription begins with the first issue.

INCOME TAX

In the report of the 90th Annual Meeting of the C.M.A., under the heading "Income Tax" on page 147 of the July 15, 1957, issue of this Journal, there is a statement referring to the retirement savings plan and running "Tax deferment applicable to 1956 will be available until February 28, 1958". This is of course incorrect, and the sentence should read "Tax deferment applicable to 1957, etc.".

Medical News in brief

"PROSTATIC" SERUM ACID PHOSPHATASE LEVEL IN PROSTATIC CANCER

Conventional methods of measuring serum acid phosphatase are of little value in diagnosis of carcinoma of the prostate, according to Bonner and his colleagues from Boston (*J.A.M.A.*, 164: 1071, 1957). A modified method of Fishman and Lerner for measuring serum acid phosphatase of prostatic origin is, however, more useful when applied intelligently to a variety of diagnostic problems. Normal values are considered by these authors to be over 0.6 King-Armstrong units of "prostatic" serum acid phosphatase per 100 ml. of serum, and 5 King-Armstrong units of "total" serum acid phosphatase. Determination of "prostatic" serum acid phosphatase is useful even when tumours are localized to the prostate, and the accuracy can be increased by administering testosterone propionate in doses of 50 mg. three times a week, which may stimulate tumour growth and be followed by a significant rise in the "prostatic" serum acid phosphatase level. Normal values led to the diagnosis of five unsuspected cases of prostatic cancer among 233 males admitted to the hospital and routinely tested.

UNDETECTED DIABETES

An investigation of 823 persons for diabetes during the years 1950-56 in a Dutch district revealed seven hitherto undetected diabetics among the 384 relatives of known diabetes patients (1.82%), whereas among 439 other persons without a known family history of the disease, six cases (1.14%) were detected. The finding of as high a number as 13 in a sample of 823 subjects suggests the desirability of a national "detection" drive in Holland.—*Nederl. tijdschr. geneesk.*, 101: 1157, 1957.

CHLORPROMAZINE IN PÆDIATRIC SURGERY

Two authors from Texas report their observations on 100 children who received chlorpromazine as preoperative medication. The children ranged in age from 11 months to 14 years; 75 were admitted for tonsillectomy and adenoidectomy, 15 for general operations, four for plastic procedures, and four for orthopædic surgery. All patients received the usual atropine and Demerol premedication, together with chlorpromazine on the basis of 0.5 mg. per kg. body weight. In 96 cases chlorpromazine was given orally two to three hours before operation, and in four intramuscularly one-half to two hours before operation. All these patients were calm and had a sense of well-being; blood pressure readings during and after operation revealed no hypotensive effects of the drug. Induction of anæsthesia was smoother and quicker and less anæsthetic was required. In tonsillectomy, rapid relaxation of the jaw made insertion of the mouth gag and airway possible early in the procedure. There was less bleeding during operation and no nausea afterwards. Most patients were mildly drowsy for four to six hours and remained quiet in bed. None required a sedative.—F. Tevetoglu and J. A. Abbey: *J. Pediat.*, 51: 181, 1957.

SERUM ENZYMES IN MUSCULAR DISORDERS

The enzyme, glutamic oxalacetic transaminase, is found in great concentration in muscle and an investigation of its activity in various pathological processes affecting muscle is therefore logical. Pearson of Los Angeles (*New England J. Med.*, 256: 1069, 1957) has studied levels of serum transaminase in 116 cases of diseases affecting skeletal muscle. Of these 87 had been diagnosed as progressive muscular dystrophy, while seven were cases of myotonic dystrophy, and 14 of various types of secondary neuromuscular atrophy. In 47 out of the 87 patients with muscular dystrophy the enzyme levels were raised. About 90% of such patients under the age of 18 had raised levels, and when pseudohypertrophy was also present in such a child, serum enzyme activity was invariably above normal. Levels were very high in a case of acute dermatomyositis and one of paroxysmal myoglobinuria. Levels were normal in myotonic dystrophy and myasthenia gravis, as in 14 cases of neuromuscular atrophy. Thus, although in six children with recent poliomyelitis progressive muscular atrophy was in progress, the enzyme levels were all normal.

It seems that in many cases of primary myopathy in which there is apparent active muscle destruction, the serum level of transaminase may provide a relatively sensitive index of the rate and magnitude of disease. Serial enzyme determinations in patients under trial with drugs may give an early objective indication of ultimate success or failure of the drug before clinical evidence is obtainable.

MEPROBAMATE FOR PREMENSTRUAL TENSION

On the basis of studies conducted on 42 women with various manifestations of premenstrual tension, treated by meprobamate or by placebo, Pennington (*J. A. M. A.*, 164: 638, 1957) recommends the use of meprobamate in doses of 400 mg. The first tablet should be taken at the first premenstrual symptom and administration should continue with one tablet after each meal until symptoms subside. Out of 28 women given meprobamate in this manner, 22 were relieved of their symptoms, whereas only three out of 42 patients were relieved by a placebo.

(Continued on advertising page 54)

Canad. M. A. J.
Sept. 15, 1957, vol. 77

REVIEW ARTICLE

CARCINOMA OF THE BREAST: SOME CONTROVERSIAL ASPECTS*

R. C. HARRISON, M.D., F.R.C.S.[C.],
A. A. W. STANLEY, M.D.,
D. J. MacGREGOR, M.D., and
J. FAHEY, M.D., *Edmonton, Alta.*

DURING THE PAST ten years several controversial points have arisen regarding the treatment of breast cancer. We propose to discuss briefly the following questions:

1. Is cancer of the breast worth treating?
2. Is the present radical mastectomy an adequate operation, or should it be extended to include supraclavicular, mediastinal, or other possible areas of spread?
3. Is simple mastectomy with postoperative radiation just as satisfactory?
4. Should bilateral oophorectomy be done in the absence of metastases?
5. Is cancer of the breast worth treating in the pregnant or lactating patient?
6. How should metastatic carcinoma of the breast be treated?

For decades after the popularization of radical mastectomy by Halsted and Meyer the treatment of cancer of the breast was standardized and accepted. In recent years its value has been challenged and other methods of treatment recommended. Such scepticism is healthy, but the evidence must be carefully weighed before such a time-tested procedure is discarded. Debunking has become a popular pastime in the medical as well as the lay literature, and therapeutic defeatism is the fashion. Concern over this recent fatalistic attitude towards carcinoma of the breast has prompted this article.

IS CANCER OF THE BREAST WORTH TREATING?

The question is not easily answered because this particular type of cancer kills slowly, and a prolonged follow-up is necessary if statistics are to be of any value. Of course the answer must be found by statistical methods, but the interpretation of statistics is not easy for one untrained in this branch of mathematics. It has been stated by McKinnon[1] and Park and Lees[2] that present methods of treatment of cancer of the breast are ineffective.

McKinnon's main argument is that mortality figures from various Departments of Vital Statistics do not show any decrease in deaths from carcinoma of the breast with passing decades. That is to say, there are just as many people dying now from cancer of the breast as there were 30 years ago. It should be mentioned that he corrects for the increasing incidence of people in the cancer age group before comparing survival. We believe it can be fairly stated that diagnoses taken from death certificates are grossly inaccurate unless postmortem has been performed. If a woman has had a mastectomy at some time in the past it is very likely that her cause of death will be listed as cancer of the breast, unless the findings point very differently in another direction. Thus we do not think that the source of McKinnon's figures is reliable, nor do we consider his sweeping assumption justified.

Park and Lees[2] also approach the problem from a statistical standpoint. Kraus[3] criticized their statistical methods and concluded that the treatment of breast cancer is effective, and the earlier the treatment is given, the more effective the treatment.

What is the natural history of untreated carcinoma of the breast? Daland[4] followed up 100 patients with treated carcinoma of the breast and charted their duration of life from the time the lump was first discovered until they died. Some of these patients were operable when first seen but refused treatment, and others were inoperable when they first sought medical attention. It is surprising that the average duration of life without treatment was 40 months, and the mean duration of life was 29 months; that is to say, at 29 months, one-half were alive and one-half were dead. Twenty-two per cent survived five years and 5% were alive at the end of 10 years. One patient was still living with a 36-year history of breast cancer. With the exception of this patient, the five surviving at the end of 10 years were all dead at 13 years.

Another series of untreated cases is reported by Greenwood, and appears in an article by Sir Stanford Cade.[5] Greenwood stated that the normal expectancy of life in a 55-year-old female is 19 years. If a woman of this age developed carcinoma of the breast and was treated while the disease was "still confined to the breast" her life expectancy would be 13 years, whereas if the disease had spread to the axilla it would be six years. Without treatment her life expectancy would be only four years.

If one superimposes the average duration of life in treated and untreated cases there is a very significant difference in life expectancy, and it is of course higher in those cases in which the disease is confined to the breast when first treated (Fig. 1). Those who believe that surgical treatment is ineffective reply that the surgeons treat only the favourable cases, and that this case selection is entirely responsible for the improvement in results shown in the treated cases. This is quite possible.

---

*One of a series of Graduate Surgical Seminars, Department of Surgery, University of Alberta.

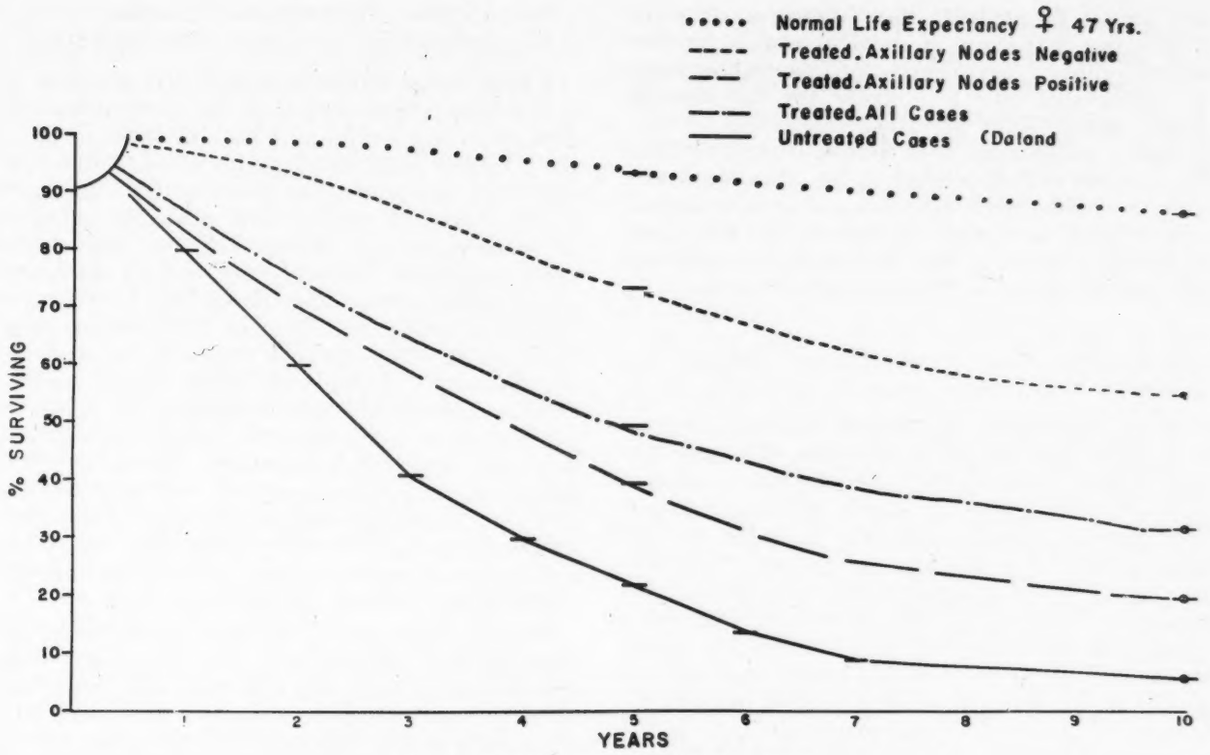


Fig. 1.—Survival in cancer of the breast.

Kraus[3] points out that those patients with an intrinsically higher grade of carcinoma will develop a palpable lump sooner, both in the breast and in the regional nodes, and that those patients with the more rapidly growing type of malignancy will therefore be made aware of their disease earlier than those with an intrinsically lower grade of malignancy. It follows then that when one considers patients presenting themselves for treatment, those with the shorter history will on the average have a higher grade of malignant disease. If one compares post-operative survival rates with duration of disease the survival rate in most series is higher in those with the short history, in spite of the fact that the biological grade of their malignancy would tend to make their survival rate lower. Certainly the grade of malignancy is going to make a marked difference in survival, and is going to markedly affect the survival rate after treatment. The cases suitable for surgical treatment when first seen are undoubtedly a selected series of cases, as the critics point out, but this pre-selection works against the surgeon rather than in his favour.

Because case selection could explain the improved results in a treated series, all cases whether treated or not must be included before comparing results with those in an untreated series. Moreover, this must also be done before comparing the results of one method of treatment with another, as staging is not reliable.

Most series in the literature do not consider the untreated cases, and cannot be used as a basis of comparison with the series of Daland and of Greenwood. An excellent recent series is that reported by Watson,[6] in which he reports all cases from one geographical area. Their over-all five-year survival rate was 48%, which compares very favourably with the 22% reported by Daland.

Another unanswered question is the absolute cure rate in breast cancer after surgical treatment. There cannot be any question that in those cases where the disease is confined to the breast the patient can be cured by surgical treatment. As can be seen by the graph in Fig. 1, "histologically negative axillary nodes" is not synonymous with "disease limited to the breast". There is a very significant reduction in survival even when the axilla is histologically negative. This is of course due to the fact that spread has occurred by pathways other than the axillary nodes before surgical treatment is carried out, or small metastases in the axilla have escaped detection by the pathologist. At the present time it is impossible to say what percentage of cases with histologically negative axillary nodes are completely cured, and the axillary positive group are even more doubtful. To establish an absolute cure rate it would be necessary to do autopsies on a series of treated cases, with special attention directed to areas where spread is known to occur.

Of course the most debatable point is: does an axillary dissection ever cure a patient with involved axillary nodes? Survival figures suggest that a significant percentage of such patients

Canad. M. A. J.
Sept. 15, 1957, vol. 77

are cured, or at least their death is delayed. While the difference in survival could conceivably be due to pre-selection of favourable cases, we think that this is unlikely for the reasons stated above. The literature on cancer of the breast is staggering. It is indeed surprising that the answers to these questions are not unequivocably available from the thousands of reported series. Such, however, appears to be the case, again corroborating the statistician's criticisms of case reporting in the medical literature.

Is Radical Mastectomy Better than Simple Mastectomy plus Radiation?

In recent years, considerable enthusiasm has been shown for simple mastectomy, followed by x-radiation to the axilla, and also for a super-radical mastectomy, in which the mediastinal and supraclavicular nodes are included in the dissection. The first might be called a contraction of surgical treatment and the second an extension, although neither is new, in that they were both tried several decades ago by other workers. Prior to the time of Halsted and Meyer, simple mastectomy was the accepted method of treatment. Because of the extremely high local recurrence rate the present radical mastectomy was advocated and has been widely adopted. Halsted[7] also tried a series of radical breast procedures in which the operative area was extended to the supraclavicular region, but he was unable to demonstrate any improvement in his results.

McWhirter[8] of Edinburgh is of the opinion that a simple mastectomy followed by heavy radiation therapy will show results that are in every way comparable with those of radical mastectomy. His published results are difficult to compare with those following conventional radical mastectomy because he includes in his series the cases which have radiation alone as well as those that have no treatment whatsoever. While we agree with this method of reporting cases, it does make comparison between his and the conventional methods of treatment almost impossible. It would appear that his results are extremely good, but it must be remembered that radiation therapy is very highly developed in his centre and it is unlikely that comparable results would be obtained if this were adopted here.

Dr. L. V. Ackerman recently addressed the Edmonton Academy of Medicine and reported on a personal survey of McWhirter's cases. There was severe radiation damage in several cases. In some cases an axillary dissection was done after radiation therapy to the axilla. Viable cancer cells persisted. Finally, many of his series had irradiation of the ovaries as well as the axilla, a fact that has never been mentioned in McWhirter's publications.

Should the Conventional Radical Mastectomy Be Extended Anatomically?

Every breast surgeon knows that about 60% of the cases considered operable have metastatic disease in the axilla, and he also knows that if the axilla is involved the chance of a five-year survival is reduced by at least one-half. In many of the cases of course, and probably in most of these cases, the disease has also spread beyond the axilla. Probably one-half of the cases with axillary node involvement also have supraclavicular node involvement and about 65% have mediastinal and/or supraclavicular node involvement.[5] Acting on this, Wangensteen, Urban, and others have extended the conventional radical mastectomy to include the mediastinal and supraclavicular areas. This is a much more extensive operation and will presumably carry a higher immediate mortality rate. The follow-up period is not sufficiently long for a comparison between these procedures and the conventional radical mastectomy.

Simple mastectomy, radical mastectomy, or super-radical mastectomy? The experience with simple mastectomy in the past has been an unhappy one because of local recurrence, and the results of the super-radical dissection are as yet unknown. We feel that the conventional radical mastectomy should be the accepted method of treatment in those centres which are not actively investigating possible improvements in therapy.

Should Bilateral Oophorectomy be added to Primary Treatment?

It has been known for 60 years that oophorectomy will result in subjective and objective improvement in many cases of metastatic disease of the breast. It is reasonable to suppose that bilateral oophorectomy added to radical mastectomy might increase survival significantly, even though there be no evidence of distant spread. Taylor[16] reported on such a series and concluded that the survival was not favourably influenced. Other series have suggested that survival might be prolonged, but proof is lacking. This procedure then should be reserved for symptomatic therapy of metastatic disease when indicated.

Is Carcinoma of the Breast Worth Treating During Pregnancy or Lactation?

Haagenson and his colleagues[11] stated that, in their experience, a patient who developed carcinoma of the breast during pregnancy or lactation seldom survived five years. While this is true in their experience, it has not been the experience of several authors, and it would appear that the prognosis in these patients is about one-half as favourable as in the non-pregnant or non-lactating woman.[12, 13]

ARE FURTHER PREGNANCIES HARMFUL?

Statistically, pregnancy following treatment for carcinoma of the breast does not appear to reduce survival, but of course these women are a highly selected group. Because of the undoubted relationship between œstrogen stimulation and the growth of malignant cells in breast cancer, one would think that pregnancy might tend to increase the rate of growth if metastatic disease was present. Because statistics tend to refute this argument, there is a marked difference of opinion regarding the management of these patients. Certainly if the axillary nodes were negative at the time of operation one would be more inclined to allow subsequent pregnancies. In general, each case must be handled on its own merits, considering the stage of the disease at the time of treatment, the desire for a child, and the health of the mother at the time pregnancy is detected.

When carcinoma of the breast is discovered during pregnancy, should the pregnancy be terminated? There is a marked difference of opinion in the literature on this point, and the question cannot be satisfactorily answered. A small series by Adair[12] would suggest that if the axillary nodes are involved continuation of the pregnancy markedly reduces survival. It is reasonable to suppose that œstrogen stimulation associated with continuation of the pregnancy might adversely affect the growth rate of residual tumour cells. Here too, all factors must be considered.

THE TREATMENT OF METASTATIC CARCINOMA OF THE BREAST

Of course, none of these patients can be cured, but because the disease in most instances spreads and grows slowly, palliative treatment may prolong survival, usually reduces pain, and is of tremendous psychological value.

Knowledge regarding the effect of the pituitary, adrenal, and ovarian hormones on cancer of the breast is only fragmentary, and much remains to be done in this field. However, between one-third and two-thirds of these cases will be favourably influenced by therapy. It would be extremely useful if the patients' hormone levels could be accurately determined, and the tumour evaluated with respect to its behaviour under varying hormone influences. Early steps have been taken in this direction, but as yet the results of therapy in the individual case cannot be foreseen.

Studies of urinary œstrogens have demonstrated that many menopausal and postmenopausal women have functioning ovarian tissue. Premenopausal patients and those with functioning ovarian tissue should have a surgical castration. Irradiation of the ovaries is not as effective, and should be reserved for the poor-risk patient. Androgen may also be given at this time, or when relapse occurs after oophorectomy or adrenalectomy. It is generally administered intramuscularly as testosterone propionate, 150 mg. thrice weekly.

In the patient with an endocrine age that is truly postmenopausal, œstrogen therapy (stilbœstrol 15 mg. per day) is indicated. This is paradoxical, but results may be good. Moreover, if an exacerbation occurs after a period of remission under œstrogen therapy, cessation of the hormone may again halt the progress of the disease.

Because œstrogens can also be produced by the adrenals, adrenalectomy has been done in many cases, with some favourable results.[14] Hypophysectomy has also been employed after oophorectomy and adrenalectomy, or when the disease again advances after oophorectomy. Replacement therapy is of course needed after any of these procedures, and is particularly difficult when both adrenalectomy and hypophysectomy are done. Hypophysectomy without adrenalectomy is proving to be a better therapeutic plan. These procedures are extremely useful in studying human endocrinology, and should be reserved for centres capable of such research.

Cortisone therapy will in some cases prove valuable when the disease progresses after oophorectomy, and may prove in time to be as useful as adrenal or pituitary surgery.

Radiation is very effective in controlling local recurrences in the chest wall, limited bone metastases, and to a lesser extent localized pulmonary lesions and supraclavicular spread.

Radioactive gold is effective in some cases in reducing or eliminating pleural and, to a lesser extent, ascitic effusions.

The most satisfying case for palliation is the patient with bony metastases, and the most discouraging the one with extensive visceral spread.

The most difficult problem for the patient dying of carcinoma is the feeling of hopelessness, and too often this is fortified by her own physician. The psychological benefits gained from an optimistic attitude and active treatment cannot be overemphasized. The effectiveness of all palliative therapy will depend to a very large extent on the attitude of the physician.

CONCLUSIONS

1. Pre-selection of cases for surgery, and failure to include untreated cases in reported series, have made interpretation of results very difficult.
2. While it cannot be unequivocably stated that carcinoma of the breast is cured in a significant percentage of cases, the weight of evidence points in that direction.
3. There is no justification for adopting a fatalistic attitude in cases suitable for treatment.
4. The better the treatment, the better will be the results.

SUMMARY

The evidence for and against effectiveness of treatment is discussed, and the conclusion drawn that cancer of the breast is well worth treating. Neither simple nor super-radical mastectomy is established as a superior procedure. Cancer of the breast is worth treating in the pregnant and lactating woman, if the disease appears to be limited to the breast and axilla. The questions of subsequent pregnancies and the treatment of metastatic disease are discussed.

REFERENCES

1. MCKINNON, N. E.: *Surg. Gynec. & Obst.*, 94: 173, 1952.
2. PARK, W. W. AND LEES, J. C.: *Ibid.*, 93: 129, 1951.
3. KRAUS, A. S.: *Ibid.*, 96: 545, 1953.
4. DALAND, E. M.: *Ibid.*, 44: 264, 1927.
5. CADE, S.: *Brit. J. Radiol.*, 21: 596, 1948.
6. WATSON, T. A.: *Surg. Gynec. & Obst.*, 104: 106, 1957.
7. HALSTED, W. S.: *Ann. Surg.*, 46: 1, 1907.
8. MCWHIRTER, R.: *Brit. J. Radiol.*, 21: 599, 1948.
9. HANDLEY, R. S. AND THACKRAY, A. C.: *Lancet*, 2: 276, 1949.
10. TAYLOR, G. W.: *Surg. Gynec. & Obst.*, 68: 452, 1939.
11. HAAGENSON, C. D., STOUT, A. P. AND PHILLIPS, J. S.: *Ann. Surg.*, 133: 18, 1951.
12. ADAIR, F. E.: *S. Clin. North America*, 33: 313, 1953.
13. *Idem*: *Postgrad. Med.*, 8: 354, 1950.
14. HUGGINS, C. AND DAO, T. L. Y.: *Ann. Surg.*, 140: 497, 1954.

GENERAL PRACTICE

THE GENERAL PRACTITIONER AS GERIATRICIAN

J. R. D. BAYNE, M.D., *Sherbrooke, Que.*

THE MEDICAL CARE of the elderly has been deservedly receiving increased attention in the medical journals in recent years. The proportion of people over 65 years of age in the population of the countries of the western world has steadily increased until at present they constitute 10% of the population in Great Britain and 12% in France.[1] Even in younger countries such as the United States and Canada the proportion is 8.1%[2] and 7.8%[3] respectively. On the other hand, no country in South America has an elderly population over 3% of the total.[1] The causes of this phenomenon are twofold. Control of the high infant and maternal mortality rates of the last century has enabled today a large proportion of the population to survive to old age. On the other hand, a steadily dropping birth rate has resulted in a lower proportion of young people in our population today. In Canada also, the peak immigration early in this century brought in many young people who today swell the ranks of the elderly. Although the proportion of elderly in Canada is 7.8%, there is a great variation between provinces, with 5.7% in Quebec and 10.8% in British Columbia.[3]

With the increased proportion of old people in the population it is commonly believed that old people are living much longer. Statistics do not support this idea. The life expectancy of people over 65 years of age in England and Wales between 1910-12 and 1950-52 increased by only nine months for men and one year for women.[4] With the increased attention now being paid to diseases occurring in old age, however, we may expect a prolongation of life in old age for the future.

How much illness is there among the elderly? The Canadian National Sickness Survey in 1950-51[5] revealed that nearly 17 out of every 100 men over age 65 were ill when the study was started, which was 50% more illness than among people between 46 and 64 years of age, and nearly 21 out of every 100 elderly women were ill. A high proportion of these illnesses in the elderly people were disabling in that they interfered with daily living activity. A higher proportion of illnesses among the elderly had been present before the survey year began, which bears out the view that the high incidence of illness was due to chronicity of disease rather than an increased number of attacks of disease in the elderly.

Two problems therefore face the physician. He must prevent or treat disease in old people and he must endeavour to maintain their vigour and independence. One should attempt, firstly, to distinguish between old age and disease. Senescence is a process of deterioration, "a decrease in viability and an increase in vulnerability which shows itself as an increasing probability of death with increasing chronological age".[6] In populations with a high death rate at all ages, relatively few survive to die of "old age", but in Western civilization, as we have seen, there is a high proportion of elderly persons and here we see a sharp rise in the death rate in the later years. There appears to be merit in the theory that the body has a fixed amount of vital substances, partly determined by heredity, which diminishes under the stress of living, including various diseases, and is exhausted in the period known as old age. On the other hand, it may be that with the passage of time an accumulation of disease and disability finally overwhelms the vital forces. In either case, however, treatment of disease may prolong life. But it may be difficult in any special case to decide whether the patient is suffering from advanced disease or advanced age. It is dangerous to assume that because a person is old he must have advanced disease.

TREATMENT OF DISEASE

The elderly are subject to the same acute diseases as afflict younger adults and while the treatment of the disease is the same in both, the management of the elderly patient requires certain modifications in view of the limited tolerance of stress and the frequent presence of other diseases. The fluid and electrolyte balance and nutritional requirement need special attention. One must guard against treating the disease but making the patient worse. In treating pneumonia or myocardial infarction, prolonged bed rest may be advisable but in the presence of severe arthritis such bed rest may leave the patient crippled with contractures of knees and hips. Whether the patient is in hospital or at home, one should ask whoever is caring for him to put the limbs through a full range of movement several times a day, and the physician should check the limbs for developing contractures when he visits.

Many old people have unrecognized chronic renal disease and require a large fluid intake to maintain clearance of metabolites. Bed rest for an acute disease or traumatic injury makes the patient dependent on others for his fluid intake, and if his increased need is not recognized he may gradually lapse into azotæmia followed by mental confusion and a downhill course. If his fluid intake is adequately maintained, it may be forgotten that his urine output must also be greater than normal and he may have frequency. Men with prostatic hypertrophy may be unable to void lying in bed. Lack of facilities for voiding results in incontinence and the development of bedsores. Prolonged use of an indwelling catheter adds urinary tract infection to the other problems. Early independence should be aimed for, so that the patient can attend to his own needs. Attention must be paid by the physician to the details of nursing care, and his instructions must be modified to suit the individual case.

Certain diseases warrant special mention. Vascular hypertension is a perplexing condition in old people. In some instances a high blood pressure may be known to have existed for some years with no apparent progression of the disease and no symptoms. Four hundred and seventy-six old people (women over 60, men over 65) of Sheffield, England, living at home were examined; 28% of the men and 47% of the women had diastolic blood pressure of 100 mm. Hg or more; 62% of the hypertensive men and 44% of the hypertensive women considered themselves fit, the same proportion as in the normotensives. Assessment on the basis of activity also showed no difference between the hypertensives and normotensives.[7] Probably if the patient is asymptomatic and has had hypertension for years it is justifiable not to treat him.[8] If treatment is considered necessary, the rauwolfia compounds may be adequate but hydralazine (Apresoline) may be added to bring the pressure down to the desired level. It would seem reasonable to insist, once the need for treatment is decided on, that it be adequate and that the course of therapy be followed with exactitude.

Cerebrovascular lesions are a common cause of disability and death among the aged. Atheromatous narrowing or thrombosis in the internal carotid, vertebral[9] and basilar artery[10] systems may produce a characteristic picture of transient sensory or motor loss progressing to permanent paralysis or death. Prolonged anticoagulant therapy appears to prevent progression of this condition,[11-14] but its value in the more frequent lesions involving anterior and middle cerebral arteries and their branches is not conclusive. Anticoagulants are contraindicated in cases of hæmorrhage.

When hemiplegia has developed, a definite program of rehabilitation should be followed, aimed at prevention of contractures and early voluntary activity.[15] Even when no rehabilitation facilities are present, much progress can be made by having the patient in an armchair propped up by pillows, once he has regained consciousness. If the chair is placed facing the bed or the bed end, there is no danger of his falling out and he can use the rail at the bed end to pull himself forward and later to stand up.[16] Although the mortality rate within two weeks after onset of vascular hemiplegia is about 55%,[17] the salvage rate among treated survivors is gratifying. About 80% will be able to care for themselves.[15, 17] Anyone who has seen untreated hemiplegics must be struck by the tragedy of missed opportunity.

SURGERY

It is generally accepted today that the elderly should be given the same benefit of surgical treatment as younger people. Two factors should be considered. With aging goes a reduced tolerance of stress and a slower recovery from it. But the exact level of tolerance in any one case cannot easily be assessed, and mere chronological age is not a reliable criterion of operability. Secondly, in old age there is an increased probability of degenerative disease being present, particularly disease of the heart and blood vessels. In estimating surgical risk a careful history and physical examination may reveal suggestive evidence of previous intolerance of the stresses of daily living, evidence of early cardiac failure, dehydration, malnutrition or of minimal cerebrovascular lesion, which should not be loosely labelled "normal for age" but recognized as signs of definite disease processes. Cardiac disease such as acute myocardial infarction, uncontrolled arrhythmias, pericarditis and bacterial endocarditis, frequent anginal attacks and chronic cor pulmonale render patients poor surgical risks. But it is equally important to rec-

Canad. M. A. J.
Sept. 15, 1957, vol. 77

ognize that healed myocardial infarction, bundle branch block, controlled auricular fibrillation, aortic valvular disease and aneurysm alter the prognosis but little.[18]

In emergency surgery in the aged the mortality rate is several times that of elective surgery. Every effort should be made to restore fluid and electrolyte balance and blood levels as rapidly as the cardiovascular status will allow. Even a transient drop in blood pressure may precipitate myocardial infarction, peripheral vascular occlusion or cerebrovascular accident. Cases have been reported[19] of dementia after massive hæmorrhage occurring even with the patient in hospital and despite immediate steps taken to restore blood volume. Initially no more than minimal life-saving surgical procedures should be attempted. The need to perform such emergency procedures may be avoided in some cases if potentially dangerous conditions such as symptomatic biliary tract disease are treated surgically as they are recognized.[20] The anæsthetic agent used is probably of less importance than the care taken to maintain circulation and oxygenation of the tissues.[21] Premedication and anæsthesia should be as light as possible.

Provided all care is taken, the aged tolerate surgical procedures very well. In assessing a case for an operation it is well to consider what alternative can be offered if surgery is not advised. A reasonable risk may be justifiable if the alternative is prolonged misery. Diplomatic discussion with the relatives or patient himself may win confidence and understanding.

Psychological Problems

Although emotional maladjustment is not uncommon among elderly people, it is not necessarily due to aging itself but may result from the changes in environment and status common in later years. The stress of retirement, of separation from children, and often the onset of physical disability may precipitate an emotional disorder in a person hitherto adjusting adequately. Particularly the rather rigid, obsessive-compulsive type of person is vulnerable and adapts poorly.

The impaired function of sensory organs themselves, loss of hearing, visual and tactile acuity tend to increase the isolation of the elderly person from others and lead to loss of awareness of time and place. He may misinterpret what is said to him and be considered confused or forgetful. With an increasing sense of isolation and difficulty in getting about, he may cease to eat regular or adequate meals and add malnutrition to his other defects. In some cases changes can be detected which apparently are the result of aging. These are narrowing of interests, difficulty in grasping new ideas, poor concentration and easy distractability.[22] Such changes in behaviour correlate poorly with changes found in the brain at post-mortem examination.

The psychoses occurring in old age have been grouped as affective, acute delirious, arteriosclerotic, senile and late paraphrenia.[23] The differentiation is important, as treatment and prognosis vary greatly.

Acute confusional states are most commonly associated with physical disease outside the brain and the outlook is usually good, not only for recovery but for complete restoration of health.[24] In affective psychosis there is sometimes a history of previous breakdown although the episode may be precipitated by physical disease.[24] There may be an attempt at suicide. Of all cases of attempted suicide admitted to an Edinburgh general hospital 20% were in persons over 60 years of age. Most attempts were made during a depressive episode; few were impulsive. Feelings of loneliness, uselessness and fear of physical incapacity were more important factors than material social lack.[25] In a follow-up of these cases two years later it was found that 10% of the patients had successfully committed suicide,[26] therefore a threat of suicide by an elderly person must be taken very seriously.

Prevention of Disease

The family doctor is in a most advantageous position to foresee difficulties or recognize illness in the early stages in his elderly patients, and he may counsel them or persuade them to accept treatment, if they are fearful, because he is their friend as well as physician. He may be able to help an old person adjust to retirement, or to living with relatives or to moving into an old people's home. He may encourage the "isolates" to associate with others, or interest public-spirited citizens in paying regular visits to such people and in helping with housework or cooking for those too frail to manage alone. Because old people are usually happier living in their own homes, every effort should be made to keep them there even though it means frequent visits by the doctor or neighbours to see that they are managing all right. Confused or forgetful old people may be able to manage in familiar surroundings. Moving them to live with relatives or in a home or hospital may cause them to lose their bearings completely and become noisy, suspicious and hostile.

The family doctor can also prevent accidents from occurring in the home. Defective vision is an important cause. Probably 90% of old people need to use glasses, but in Great Britain when the National Health Service started, one-third of these people were using defective ones.[27] Many cases of cataract require surgical treatment. As night vision shows a progressive decline with age,[28] it is important to remove scatter rugs and high door sills, and to light stairways and provide hand rails. Care of the feet is as important for old people as for dia-

betics; bunions and callouses need treatment and horny toe nails may have to be cut with strong clippers. Strong lace-up shoes and a rubber-tipped walking stick may have to be suggested. Such details often do not occur to an elderly person, or seem too difficult to acquire.

Early recognition of disease and treatment at home or in hospital may prevent its advance. In some cases however staying at home becomes impossible. As soon as this can be recognized, plans should be made by the relatives and the doctor for future care. Only in this way can "social emergencies" be avoided and adequate arrangements made. Old people suffering from disease, whether "acute" or "chronic", which needs treatment in hospital should be admitted to hospital and a large proportion will be able to return home.[29] For those who cannot, because of illness, live at home or in an old people's home wards must be available where they can continue to receive medical supervision. Lack of such facilities results in patients remaining in "acute" hospital beds when they should be elsewhere. The need is not for "chronic sick" hospitals, for these merely become repositories for forgotten people. In reviewing custodial cases in a New York hospital, Dacso *et al.*[30] found that 90% had no medically justifiable reason for being there. We have elsewhere reported[31] a remarkable case where a woman was kept in the "chronic wards" for 20 years despite her requests for discharge, and finally at the age of 72 after 30 weeks of rehabilitation in a geriatric unit was discharged to an old people's home completely independent. Since the care of old people largely devolves upon the general practitioner, he must be, among his other specialties, a "geriatrician", able to treat acute and chronic disease and give rehabilitation at home or in hospital. His care must include early planning for the day when they must leave the hospital, and the patient must also know what is being planned. To aid in treating chronic sick patients, the doctor may encourage a home nursing program at his hospital, the establishment of a long-stay annex for prolonged convalescence, or the establishment of special wards for the prolonged treatment of such cases.

SUMMARY

The increasing proportion of old people in the population, and the higher incidence of disease, especially chronic disease, among the elderly, is resulting in an increasing amount of ill health and unhappiness in the community. Some aspects of treatment of disease and prevention of disability in the aged are discussed and the management of those requiring hospital care is indicated. Patients with chronic disease needing treatment should not be deprived of hospital care, but it is the doctor's responsibility to see to it that plans are made early so they may leave hospital when they cease to benefit further from its facilities.

REFERENCES

1. DURLAND, J. D.: *In*: Old age in the modern world. Report of the Third Congress of the International Association of Gerontology, E. & S. Livingstone, Ltd., London, 1955, p. 32.
2. RUSK, H. A. AND DACSO, M. M.: Rehabilitation in the Aged, *In*: Problems of aging, 28th Annual Graduate Fortnight, New York Academy of Medicine, New York, 1956.
3. Canada, Department of National Health and Welfare: Occupational Health, Suppl. No. 31, *In*: *Canada's National Health and Welfare*, 10: September, 1955.
4. TITMUSS, R. M.: *In*: Old age in the modern world. Report of the Third Congress of the International Association of Gerontology, E. & S. Livingstone, Ltd., London, 1955, p. 45.
5. Canada, Dominion Bureau of Statistics and Department of National Health and Welfare: Canadian Sickness Survey 1950-51, Incidence and Prevalence of Illness (National Estimates), No. 7, Queen's Printer and Controller of Stationery, Ottawa, 1955.
6. COMFORT, A.: Biology of senescence, Routledge & Kegan Paul, Ltd., London, 1956.
7. HOBSON, W. AND PEMBERTON, J.: The health of the elderly at home, Butterworth & Co., Ltd., London, 1955.
8. SCHROEDER, H. A.: *J. Gerontol.*, 11: 397, 1956.
9. HUTCHINSON, E. C. AND YATES, P. O.: *Lancet*, 1: 2, 1957.
10. KUBIK, C. S. AND ADAMS, R. D.: *Brain*, 69 (part 2): 73, 1946.
11. MILLIKAN, C. H., SIEKERT, R. G. AND SHICK, R. M.: *Proc. Staff Meet. Mayo Clin.*, 30: 578, 1955.
12. MILLIKAN, C. H. AND SIEKERT, R. G.: *Ibid.*, 30: 61, 1955.
13. SIEKERT, R. G. AND MILLIKAN, C. H.: *Ibid.*, 30: 93, 1955.
14. MILLIKAN, C. H., SIEKERT, R. G. AND SHICK, R. M.: *Ibid.*, 30: 116, 1955.
15. ABRAMSON, A. S.: *Canad. M. A. J.*, 72: 327, 1955.
16. WARREN, M. W.: *M. Press*, 219: 396, 1948.
17. BAYNE, J. R. D. AND WARREN, M. W.: Analysis of Cases of Vascular Hemiplegia Admitted to a General Hospital in 1 Year (unpublished).
18. LADUE, J. S.: *In*: Problems of aging, 28th Annual Graduate Fortnight, New York Academy of Medicine, New York, 1956, p. 114.
19. BEDFORD, P. D.: *Lancet*, 2: 750, 1956.
20. GLENN, F.: *In*: Problems of aging, 28th Annual Graduate Fortnight, New York Academy of Medicine, New York, 1956, p. 162.
21. PAPPER, E. M.: *Ibid.*, p. 180.
22. ADAMS, J. R.: *M. Clin. North America*, 11, 1956.
23. MAYER-GROSS, W., SLATER, E. AND ROTH, M.: Clinical psychiatry, Cassell & Co., Ltd., London, 1954.
24. KAY, D. W. K. AND ROTH, M.: *Lancet*, 2: 740, 1955.
25. BATCHELOR, I. R. C. AND NAPIER, M. B.: *Brit. M. J.*, 2: 1186, 1953.
26. SHELDON, J. H.: *In*: Old age in the modern world. Report of the Third Congress of the International Association of Gerontology, E. & S. Livingstone, Ltd., London, 1955.
27. SHELDON, J. H.: *Ibid.*, p. 15.
28. MACFARLAND, R.: *In*: Problems of aging, 28th Annual Graduate Fortnight, New York Academy of Medicine, New York, 1956, p. 13.
29. AMULREE, LORD: *Lancet*, 2: 571, 1955.
30. DACSO, M. M. *et al.*: Rehabilitation Monograph 7, Institute of Physical Medicine and Rehabilitation, New York University—Bellevue Medical Center, 1954.
31. BAYNE, J. R. D. AND WARREN, M.: *Lancet*, 1: 1317, 1955.

313 High Street, Sherbrooke, Que.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

MEDICAL FILMS

INQUIRIES RECEIVED at C.M.A. House and surveys of the utilization of medical films suggest that motion pictures are recognized as important media for the dissemination of medical knowledge, not only in the classroom but also before all types of medical meetings. With this in mind, the Journal will list in this and subsequent issues information on medical and related motion pictures available.

Initially, listings will be restricted to films held in the National Medical and Biological Film Library and distributed by the Canadian Film Institute, 142 Sparks Street, Ottawa, Ontario.

THE NATIONAL MEDICAL AND BIOLOGICAL FILM LIBRARY

In 1944 the National Film Board was requested by the Department of National Health and Welfare to build a collection of films in medicine and biology for distribution to Canadian medical schools, training hospitals and doctors. With the advice of committees of doctors the National Medical and Biological Film Library was built up during the next three years.

With the formation of the Scientific Film Division of the Canadian Film Institute, distributor of the films, in 1948, a medical committee was appointed to assist the Department, The National Film Board and the Institute in the operation of this film library. The members of the Committee are: Dr. G. H. Ettinger, dean of the Faculty of Medicine, Queen's University, chairman of the Committee; Dr. G. D. W. Cameron, Ottawa, Deputy Minister of National Health; Dr. L. F. Bélanger, professor of embryology, Ottawa University; Dr. G. W. R. Armstrong, Ottawa; Dr. D. A. Carmichael, Ottawa, director of the National Medical and Biological Film Library; and Dr. L. Hampson, Ottawa, representing the Scientific Division of the Institute.

In 1956 the National Film Board decided that a film collection of such specialized nature could be handled more effectively by the Canadian Film Institute and responsibility for the library was turned over to that body. Having accepted this responsibility for the library, the Institute established a Medical Advisory Committee to assist the Board of Directors in the formulating of policy on use of the library, the purchase of films, evaluation of films, distribution and financing. Chairman of this committee is Dr. J. B. Collip, dean of the Faculty of Medicine, University of Western Ontario.

Today the National Medical and Biological Film Library has some 350 films for distribution.

ANÆSTHESIOLOGY

(Films listed in this department are classified by subject matter. Evaluations, where given, are those submitted by the distributor, Canadian Film Institute, 142 Sparks Street, Ottawa, Ontario.)

Anæsthesia in the Dental Chair (1948) Sound B & W 23 minutes.

Produced by Realist Film Unit, for Imperial Chemical Industries Limited. Technical Advisers: Guy's Hospital Dental School, and the Dental Department of Guy's Hospital, London, England. *The Technique of Anæsthesia series, No. 12.*

Description.—An instructional film, demonstrating the management and technique of dental office general anæsthesia, with reference to the adult person. Technique for administering nitrous oxide-oxygen to average patient is shown: examination and preparation; induction; throat pack; setting of the mixture; stance during extractions; recovery. Discussion of mistakes and of the unreliability as signs of anæsthesia of relaxed limbs, dilated pupils or cyanosis. Jactitation is shown. Technique in difficult cases: patient with trismus; obstinate mouth-breather; resistant patients (use of other agents as adjuvants to nitrous oxide, of pre-anæsthetic sedatives and of intravenous agents). Portable anæsthesia equipment, as carried in the MacIntosh bag.

Appraisal (1949).—An excellent demonstration, directed to specialists in anæsthesia rather than the occasional anæsthetist. Recommended for senior medical students, and suitable for other medical and dental audiences and for nurses. Types of apparatus and methods are typically English, but principles are sound and up-to-date. Main usefulness of film is its emphasis on the importance of details of management from both psychological and technical points of view, which make for successful result regardless of apparatus or agent used. *Unsuitable for non-medical audiences.*

Availability.—National Medical and Biological Film Library ($2.00). Purchase from Imperial Chemical (Pharmaceuticals) Limited, Fulshaw Hall, Wilmslow, Manchester, England.

Anæsthesia in the Dental Chair for Children (1948) Sound B & W 11 minutes.

Produced by Realist Film Unit, for Imperial Chemical Industries Limited. Technical Advisers: Guy's Hospital Dental School, and the Dental Department of Guy's Hospital, London, England. *The Technique of Anæsthesia series. No. 13.*

Description.—An instructional film, demonstrating the management and technique of dental office general anæsthesia, with particular reference to the problems of children. Ways of reassuring the average child and achieving his co-operation are described. Film then demonstrates induction and maintenance of anæsthesia with nitrous oxide; difficulty of maintaining an even level due to child's small vital capacity. Use of pre-anæsthetic sedatives for nervous children is demonstrated. Demonstration of technique of induction with ethyl chloride, possible difficulties such as crying during induction, breath holding, laryngeal spasm. Use of divinyl ether for younger child; administration, with the Oxford inhaler; recovery. Responsibility of the anæsthetist in giving a child its first experience of anæsthesia.

Appraisal (1949).—A good demonstration, particularly valuable because it points out the great importance of a proper psychological approach and demonstrates the particular difficulties with this type of patient. One criticism: no emphasis on circulatory disturbances frequently encountered with ethyl chloride (although watch on respiration is stressed). Recommended for specialists in anæsthesia and for senior medical students, and suitable for other medical and dental audiences and for nurses. *Unsuitable for non-medical audiences.*

Availabliity.—National Medical and Biological Film Library ($1.00). Purchase from Imperial Chemical (Pharmaceuticals) Limited, Fulshaw Hall, Wilmslow, Manchester, England.

The Carbon Dioxide Absorption Technique (1944) Sound B & W 24 minutes.

Produced by the Realist Film Unit, for Imperial Chemical Industries Limited. Technical Advisers: Department of Anæsthetics, Westminster Hospital, London, England. *The Technique of Anæsthesia series, No. 4.*

Description.—An instructional-training film, illustrating the principles, apparatus and techniques of carbon dioxide absorption from anæsthetic atmospheres. The basis of carbon dioxide absorption technique is outlined and animation shows a total rebreathing circuit with CO_2 absorption. Preparation of the soda lime canister and its function. Principles, apparatus, induction and maintenance are illustrated for: single phase absorption; closed circuit or two-phase absorption; partial absorption. Advantages of the CO_2 absorption technique described and illustrated.

Appraisal (1946).—This film is recommended for senior medical students, interns, general practitioners, nurses and specialists in anæsthesia. The animation and the diction are particularly good. Although the visuals depict English machines and methods not in use in Canada, the film can be appreciated by Canadian anæsthetists. *Unsuitable for non-medical audiences.*

Availability.—National Medical and Biological Film Library ($2.00). Purchase (in Canada) from the Distribution Branch, National Film Board, P.O. Box 6100, Montreal 3, P.Q.

The Dynamics of Respiration (1938) Silent Colour 43 minutes.

Produced by the Departments of Anesthesia, Radiology and Photography, University of Wisconsin Medical School, directed by W. H. Cassels, M.D.

Description.—An instructional film, demonstrating the underlying principles of respiration, with particular reference to anæsthesia. Normal respiration shown by animation, in living and by fluoroscopic and x-ray views. Voluntary inhibition of intercostals. Partial intercostal paralysis in 3rd plane anæsthesia. Complete intercostal paralysis in 4th plane. Complete intercostal paralysis due to injury to 7th cervical segment. Upper respiratory obstruction simulating intercostal paralysis during anæsthesia. Voluntary unilateral intercostal activity. Voluntary inhibition of diaphragm. Diaphragmatic paralysis during anæsthesia. Complete diaphragmatic and intercostal paralysis in polio. Complete respiratory paralysis in 4th plane anæsthesia. Prolonged apnœa during deep anæsthesia. Upper respiratory obstruction. Laryngeal obstruction. Intra-abdominal pressure of large cyst preventing proper filling of lungs. Pulmonary fibrosis of tuberculous origin. Localized paradoxical respiration following thoracoplasty. Massive collapse during endotracheal anæsthesia.

Appraisal (1945).—A classical presentation of the principles of respiration, especially as applied to anæsthesia. Up-to-date and timeless, and recommended for medical students, interns, nurses, general practitioners and specialists in anæsthesia. *Unsuitable for non-medical audiences.*

Availability.—National Medical and Biological Film Library ($6.00). For purchase apply to Geo. W. Colborn Laboratory, 164 North Wacker Drive, Chicago 6, Illinois.

Intravenous Anæsthesia: Part One (1944) Sound B & W 30 minutes.

Produced by Realist Film Unit, for Imperial Chemical Industries Limited. Technical Advisers: Department of Anæsthetics, Westminster Hospital, London. *The Technique of Anæsthesia series, No. 6.*

Description.—An instructional-training film, demonstrating the principles and practice of intravenous anæsthesia with sodium pentothal. Required apparatus, preparation of solution and filling of syringe. Detailed demonstration of technique of venipuncture, showing incorrect methods and possible complications. Course of intravenous anæsthesia; premedication; dangers of pentothal and preventive procedures; b.p. during pentothal anæsthesia. Indications and contraindications. Postoperative condition and general care of patient.

Appraisal (1945).—A well-done film with regard to both underlying principles and to techniques. Highly suitable for instructional purposes, although only a partial presentation of the subject—shows induction and intermittent administration. Photography and diction are very good. Recommended for senior medical students, interns, general practitioners, nurses and specialists in anæsthesia. *Unsuitable for non-medical audiences.*

Availability.—National Medical and Biological Film Library ($3.00). Purchase (in Canada) from Distribution Branch, National Film Board of Canada, P.O. Box 6100, Montreal 3, P.Q.

Intravenous Anæsthesia: Part Two (1944) Sound B & W 25 minutes.

Produced by Realist Film Unit, for Imperial Chemical Industries Limited. Technical Advisers: Department of Anæsthetics, Westminster Hospital, London. *The Technique of Anæsthesia series, No. 7.*

Description.—An instructional-training film, demonstrating the principles and practice of intravenous anæsthesia with sodium pentothal. The following techniques and uses of intravenous anæsthesia are shown and discussed: continuous drip infusion; pentothal for ophthalmic operations; pentothal for general manipulations; pentothal as a basal anæsthetic—(1) before nitrous oxide, (2) before regional anæsthesia; pentothal for induction of anæsthesia—(1) before open drop ether, (2) before nitrous oxide-oxygen-ether; nitrous oxide-oxygen-pentothal anæsthesia.

Appraisal (1946).—A good film for the specialist, and useful for the instruction of senior medical students and interns. Techniques shown are distinctly English and somewhat different methods are in common use in this country; no extravagant claims are made. *Unsuitable for non-medical audiences.*

Availability.—National Medical and Biological Film Library ($2.50). Purchase (in Canada) from Distribution Branch, National Film Board of Canada, P.O. Box 6100, Montreal 3, P.Q.

Refrigeration Anæsthesia (1944) Silent Colour 33 minutes.

Produced by Frederick M. Allen, M.D., and Lyman Weeks Crossman, M.D., City Hospital, New York, N.Y.

Description.—A record-instructional film, illustrating the principles and use of refrigeration anæsthesia in amputations of the lower extremity. After an outline of the underlying principles, refrigeration anæsthesia for a below-knee amputation in a case of arterio-sclerotic gangrene of the foot is shown, using flexible freezepacks prior to tourniquet, and application of 4-inch thickness of snow ice to entire extremity for refrigeration. Use of refrigeration blanket and thermocouple needle is demonstrated in an above-knee amputation in a case of infected gangrenous foot in a diabetic arterio-sclerotic.

Appraisal (1946).—A well done film, with excellent photography, which is recommended for anæsthetists and general surgeons. It is suitable for senior medical students, interns, nurses and other medical audiences. *Unsuitable for non-medical audiences.*

Availability.—National Medical and Biological Film Library ($4.00). Purchase apply to Lyman Weeks Crossman, M.D., Woods Building, Baytown, Texas.

This list will be continued in subsequent issues of the Journal.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

MEDICAL SOCIETIES

THE HARVEY TERCENTENARY CONGRESS, LONDON, JUNE 3 TO JUNE 8, 1957

HAROLD N. SEGALL, M.D., *Montreal*

Few men who lived 300 years ago are now remembered with the reverence and homage devoted to William Harvey this year. His major contribution, the little book of about one hundred pages, "de Motu Cordis", establishes him as one of the immortals in the domain of science. On the one hand, he demonstrated the true nature of the heart's function and on the other he set a pattern for future workers in the biological sciences. Some scholars maintain that the latter is his more important achievement and the principal indication of his greatness. To fully appreciate the justice of this view one must read the book "de Motu Cordis" and appraise its impact on the scholars and students of the early 17th century. Galen's concept of the functions of the heart, the arteries, veins and blood had been accepted and taught for 1400 years. Now this Guilielmus Harvius Anglus, William Harvey, the Englishman, presented an entirely new and revolutionary concept which he proved with the aid of animal experiments and logical deduction. In 1628 it was not only audacious but dangerous to do such things. His contemporary Galileo narrowly escaped burning at the stake for analogous behaviour. Inspired by his teacher Fabricius who had demonstrated the presence of valves in the veins, Harvey evolved his thesis probably between 1604 and 1612. He taught his views of the circulation in the Lumleian Lectures which he began to give at the Royal College of Physicians in 1616. His friends prevailed upon him to publish his work. Harvey alludes to the risk involved, in Chapter VIII, in which he discusses the quantity of blood passing through the heart from the veins to the arteries and the circular motion of the blood. "But what remains to be said upon the quantity of and source of blood which thus passes, is of so novel and unheard-of character, that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom, that become as nature, and doctrine once sown and that hath struck deep root, and respect for antiquity influence all men; still, the die is cast, and my trust is in my love of truth, and the candour that inheres in cultivated minds." In my copy of the English translation by Willis, I recently found that I had underlined these sentences when I read the book in 1926; I read it again before going to attend the Harvey Tercentenary Congress. Presently I shall read the most recent translation by Professor Kenneth J. Franklin of Barts as a contribution to the Tercentenary Ceremonies. This book appeared first on sale at the bookshops in London at the end of May of this year, and each male delegate was given a numbered copy of it as a gift from the Harveian Society of London under whose auspices the Congress was held. One hundred and ten years separate these last two translations into English, that of Willis, the anatomist, from that of Franklin, the physiologist. Willis was invited to do the task by the Sydenham Society of England. The initial stimulus which led to Franklin's translation came from Dr. John Fulton of Yale who is no less famous as a medical historian, the biographer of Harvey Cushing, than as a physiologist. In about 1955 John Fulton communicated his idea that the Harvey Tercentenary should be marked by a new English translation of "de Motu Cordis" to the president of the Royal College of Physicians, Sir Russell Brain. The college decided that Kenneth J. Franklin should perform the task. On reflection one must conclude that after all other aspects and events of this Congress will pass into relative oblivion this book will stand out as the only signal of this event to remind people wherever English is read of the monumental work of Harvey and of this Tercentenary celebration.

At this point it is appropriate to quote the same few sentences from Chapter VIII to compare the rendering by Willis with that by Franklin. "The remaining matters, however, (namely, the amount and the source of the blood, which so crosses through from the veins into the arteries), though well worthy of consideration, are so novel and hitherto unmentioned that, in speaking of them, I not only fear that I may suffer from the ill-will of a few, but dread lest all men turn against me. To such an extent is it virtually second nature for all to follow accepted usage and teaching which, since its first implanting, has become deep-rooted; to such an extent are men swayed by a pardonable respect for the ancient authors. However, the die is cast and my hope lies in the love of truth and the clear sightedness of the trained mind."

The headquarters of the Tercentenary Congress, the Royal College of Surgeons, appears to have been chosen because it afforded the necessary space. The recently reconstructed Great Hall is a long room about 50 feet wide and 150 feet long. It is well equipped with modern audiovisual demonstration instruments. The first official session on June 3 at 9:30 a.m. was preceded by a procession of dignitaries down the aisle between the two rows of seats in the Hall to the platform, led by Mr. Dickson Wright, president of the Harveian Society and of the Congress. The first item on the program was a paper by Professor Kenneth H. Franklin entitled "Fabricius, Harvey and Lower".

The next paper was delivered by John Fulton, a most interested and important delegate. The title of his paper is "The Reception of the Harveian Discovery in Europe: Malpighi, Leeuwenhoek and Hales".

The third communication was given by Sir Charles Dodds, who spoke on "Harvey, Scientist and Physician". He gave significance to the question "What was Harvey's mental attitude to the silly therapeutic techniques of his day? Did Harvey the

scientist deplore them while Harvey the physician used them, for lack of anything better, or because his patients expected such therapy rather than none at all?" This question could well be applied to any modern physician who is also a scientist. The final paper of this morning session was that of Dr. F. A. Willius of the Mayo Clinic, entitled "Historical Sequences Relating to Certain Congenital Anomalies and Great Vessels". Unfortunately, Willius was too ill to make the journey and the paper was read by Dr. Thomas Cotton, a Montreal physician who settled in London after World War I but retains his accent derived from the Eastern Townships of Quebec. Willius mentioned about a dozen contributors to the evolution of our knowledge of congenital heart disease, prominent among them the late Dr. Maude Abbott. This led me to boast to my neighbour that the famous murals in the National Heart Institute in Mexico, executed by Diego Rivera to depict the world history of cardiology, include the picture of only one Canadian and only one woman, both in the person of Maude Abbott.

The remainder of this day's sessions and those of the next three and a half days were devoted to a variety of papers under the general titles of "The Role of the Heart in the Circulation"; "Hæmodynamics"; "Coronary Circulation"; "Pulmonary Circulation"; "Results of Cardiac Surgery"; "Cerebral Circulation"; "Splanchnic Circulation"; "Peripheral Circulation". On one day, Thursday, June 6, the Cardiac Society of Great Britain held an all-day meeting, simultaneously with the program on cerebral and splanchnic circulation. I attended the Cardiac Society meeting at which 12 papers on clinical aspects of cardiology maintained my interest continuously. Drs. Lawrie and Howit looked for advantages of vector cardiography over electrocardiography in the detection of myocardial infarction in 50 cases and found very little. Dr. Goodwin presented the quite familiar patterns which show the influence of ventricular hypertrophy on the electrocardiogram of myocardial infarction. A team of four led by J. F. Pantridge tried to solve the problem of accounting for the hypertension in coarctation of the aorta. They were not able to rule out renal and humoral elements as etiological factors. Dr. William Evans proposed that benign hypertension should be known as "hypertonia" so as to distinguish it from hypertension associated with evidence of disease. Fleming and Gibson tried to identify an electrocardiographic pattern which is diagnostic of aortic stenosis, but did not convince me they had found one. Arthur Holman examined the electrocardiograms of infants to search for signs which would help to distinguish between pathological and physiological right axis deviation. A tall P-wave in lead 2 appears to be evidence in favour of right ventricular hypertrophy, and some other features which depend on precise measurement of R and S gradients in the chest leads are also helpful. Dr. Evan Bedford, speaking under the umbrella of a modest title "Some Aspects of Atrial Septal Defects", described the medical work related to the surgical treatment of 41 cases with only one death; the operations were performed under hypothermia; the majority of the patients were adults.

Bonham-Carter reviewed the clinico-pathological aspects of 200 infants under two years of age with fatal types of congenital heart disease. Some of these might have been saved by surgical therapy if they had been recognized early enough and treated by a medico-surgical team familiar with the small hearts of infants. Frederic Jackson reported on extensive observations of cardiodynamics in 11 cases of constrictive pericarditis. Preoperatively high atrial pressure, reduced cardiac output and reduced stroke volume were found; after operation these usually became normal. The Y wave of the jugular pulse tracing was found to be shallower than normal in only one case; this may be a clinical clue to calcification of the pericardium which was observed in only this case.

These few papers lend themselves to being briefly summarized. It would be difficult to treat Gregg's paper on "Regulation of the Collateral and Coronary Circulation" in similar fashion. You may infer what it contained when I add that it was followed by Claude Beck's communication on the surgical treatment of impaired coronary circulation. His latest technique is based mainly on the work of Louis Gross, who showed that ligation of the coronary sinus improves collateral circulation, and he also applies asbestos powder to effect pericardial adhesions which bring with them capillary and arteriolar anastomoses. He had done 100 cases without a single death. In another program, the next day, when the "Results of Cardiac Surgery" were being discussed, Sir Russell Brock declared that none of the techniques so far proposed for the improvement of coronary circulation appeared sufficiently effective and that, so far, he has refrained from performing any operations of this kind. This remark of Sir Russell's was made towards the end of the hour-long panel conference* by trans-Atlantic telephone with participation of an American panel seated on the platform of Carnegie Hall during a session of the American Medical Association meeting and the English panel in the Great Hall of the Royal College of Surgeons. Reception of the voices was excellent on both sides of the Atlantic. De Bakey, Blalock, Gibson, Gerode and Burch in New York spoke with Sir Clement Price Thomas, Brock, Campbell and D'Allaines in London as though they were all in one room. There was hardly any disagreement on views and techniques related to cardiac surgery except the comment by Brock about coronary circulation, which was not challenged. Dr. Beck was in our audience but declined a wink-invitation from Sir Clement.

I had the pleasure of hearing three excellent papers on pulmonary circulation during the morning session of this Wednesday, June 5. The first, by André Cournand, consisted of a general review

*Sponsored by the Smith Kline and French Company.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

of his work, such as he might have presented when he was given the Nobel prize which he shared with Forsmann and Richards. He mentioned a fact which was new to me, namely, that Forsmann performed catheterization on himself nine times, and stopped only when he had exhausted the supply of necessary arm veins. Cournand discussed the Fick principle critically before demonstrating its application to the study of circulation. Thus he identified the limitations of the method before presenting conclusions derived from using it in the calculation of blood flow and relative blood volumes. I look forward to reading this article when it appears in print for I was not able to get full notes, especially concerning the ideal system with which he compared the actual experimental system.

Professor C. V. Harrison, the pathologist of the Postgraduate School of London, showed some beautiful preparations of pulmonary circulation visualized by post-mortem injections which were compared with angiographic pictures made during life in the same cases. This technique contributes much to polishing the knowledge required for interpreting angiocardiographic pictures.

Dr. S. Radner, of the University of Lund, described work with a technique that is new to me. He inserted a long needle, starting in the suprasternal region so that it passed through the aorta, through the pulmonary artery and into the left auricle. He calls it the "suprasternal puncture". His objective is to obtain samples of blood from the left auricle as well as pressure curves from this chamber which are recorded simultaneously with curves from systemic and pulmonary arteries. He has done this 170 times in 232 cases with only one serious complication, cardiac tamponade which was not recognized in time to treat it and so the patient died. From his data he derived information concerning the movements of the mitral valve. This is yet another paper which must be studied critically to be appreciated.

The congress was first conceived about two years ago and during the past year the work of active organization was in continuous progress. On registering, each delegate was given a large red envelope tied with gold string. In addition to the program booklets it contained invitations to many receptions, pamphlets about Harvey, a biographical sketch by Mark Halloway, and a catalogue of the exhibit in the Royal College of Surgeons which included various portraits of Harvey. One interesting item in this exhibit was a letter from his father-in-law to a high government official asking that Harvey be appointed physician to King James I. His father-in-law was himself a distinguished, politically prominent physician, Dr. Lancelot Browne. Harvey got the job and stayed after the death of James I to be physician to the fateful King Charles I. One of the speakers at the congress referred to him as "our most stupid king". The red envelope also contained a whole pack of cards, formal invitations to a variety of official receptions which proved to be cocktail parties, and of course to the main social event, the dinner on Wednesday evening. These receptions proved to be the initiators of social chain-reactions. For example, at the Government Reception in Lancaster House on Tuesday, June 4, I met Dr. John Erskine Malcolm, whose little monograph on "Blood Pressure Sounds and Their Meaning" I had read about a month ago. We had much in common and spent much of the evening together. The next day I received a note from him inviting me to luncheon with him as guests of his brother-in-law, Dr. Richard Fiennes (pronounced Fine), who is research pathologist at the London Zoo. We spent two hours at the zoo, much of it hearing Dr. Fiennes's stories of Kenya, where he had lived for about 15 years, and then for about an hour we visited the animals in a behind-the-scenes atmosphere with an authority to tell us about the personalities and medical aspects of monkeys, orang-outangs, and especially about "Guy the Gorilla" who presents a classic picture of majestic ugliness. I learnt that a python—there were several specimens on view—can swallow a live goat whole and then does not eat again for a month while he digests this meal. This experience, a most delightful and informative two hours, was not on my agenda when I left Montreal. Such surprises lend charm to travel.

Then there was the Exhibit at Wellcome Historical Museum, which was opened by Sir Russell Brain. From a rich collection of Harveiana a most informative exhibit was expertly arranged. We could learn how doctors practised in Harvey's time, what surgical instruments they had available, and what prescriptions they wrote. Harvey was renowned as an obstetrician-gynæcologist in his day; there were specimens of iron vaginal specula used in his time. There were several portraits of Harvey and a whole series of various editions of his books, both in Latin and in translation into English and other languages. I was pleased to note that Professor Charles Laubry of Paris had translated "de Motu Cordis" from Latin into French in 1950.

Another rich exhibit was at the Royal College of Physicians, situated just behind Canada House. There, among other significant Harveiana, is the diploma which he received at Padua in 1602 when he was 24 years old and after he had spent five years at this great focus of the Renaissance, studying medicine where Vesalius had so recently laid the foundations of modern anatomy and of medicine.

It was also at the Royal College of Physicians that we viewed a new film which depicts Harvey's experiments to prove the circulation of the blood. Sir Henry Dale, who had collaborated with Sir Thomas Lewis in making the first film in 1928, introduces the new film, made so as to take advantage of improved techniques, such as colour and sound to make a better record. This film will be available for sale, and each medical school in our country should have one to show first-year students as an introduction to the course in medicine. A copy of this film will cost about £120 (about $350.00).

The outstanding personality of the Congress was Sir Henry Dale, who was one of the speakers at the dinner at the Dorchester Hotel. He referred to the interesting fact that in his lifetime there had been three Harvey tercentenaries: that of his birth in 1878 when Sir Henry was three years old, then the 1928 tercentenary of the publication of "de Motu Cordis", and now the 300th anniversary of Harvey's death at the age of 79. The dinner was the last function that I attended, though I had planned to go to Folkestone for a program of historical interest in the town where Harvey was born. This was to include a dinner at which plates and other utensils of Harvey's time were to be used.

THE PHARMACOLOGICAL SOCIETY OF CANADA

The Pharmacological Society of Canada held its first spring meeting in the University of Alberta, Edmonton, on Tuesday, June 18, 1957. On the previous evening members were received by Professor and Mrs. Charles W. Nash at their home. Most of the Tuesday was taken up with scientific papers, after which a business meeting was held, followed by the pharmacology dinner in the men's residence, Athabasca Hall, at which Dr. E. J. Millar, spoke on "Health Education in Canadian Public Schools". The meeting concluded with a symposium on the clinical assessment of drug toxicity.

It is hoped to publish later a few of the papers with a definite clinical appeal given at this meeting. Abstracts of some of the other contributions follow.

Salicylate blood levels attained with plain acetylsalicylic acid and acetylsalicylic acid in combination with magnesium carbonate and aluminum glycinate—J. M. Parker and E. Lozinski (Charles E. Frosst & Co., Montreal).

Two commercial preparations of acetylsalicylic acid, a plain and a "buffered" tablet, were used. Ten subjects participated in four trials. A reversal type of experimental design was used with replication. Salicylate blood levels were determined by the method of Brodie as modified by Lester. Significant differences were found between subjects and trials, but no significant difference was found in the blood levels attained at one, two, or three hours with the two preparations. The greatest differences between subjects and between trials occurred at the first hour. This is most likely a reflection of the individual and different occasion variations related to gastric contents, gastric emptying time, tablet disintegration and salicylate absorption.

Experimental assessment of the analeptic action of bemegride (Megimide) in acute barbiturate poisoning—K. I. Melville and G. E. Joron (McGill University, Montreal).

One of the main difficulties in the treatment of acute barbiturate and other types of central nervous system (C.N.S.) depressant poisonings has been to counteract the prolonged coma, respiratory depression and circulatory collapse which ensue in these cases. In order to assess the efficacy of varying doses of bemegride (2.5 to 50 mg./kg.) in connection with this problem, respiratory, blood pressure and ECG changes were recorded in 30 dogs, depressed by single or repeated doses of pentobarbital sodium (20 to 40 mg./kg.) or phenobarbital sodium (100 mg./kg.) injected intravenously. In some experiments treatment was also supplemented by other analeptics (amiphenazole, caffeine, methamphetamine, noradrenaline and methoxamine). It was observed that bemegride, injected *immediately* after the barbiturates, rapidly counteracts the respiratory depression, and the general C.N.S. depression is temporarily antagonized. In comparison with untreated controls, the duration of depression was not significantly prolonged, but with repeated injections of both the barbiturate and the antidote, animals can be protected against two to three times the cumulated fatal doses of the barbiturates. Repeated large doses of the barbiturates also lead to immediate respiratory arrest, but this can be effectively antagonized, although progressive circulatory collapse follows; supplementary analeptic treatment led to variable results. When injected at *longer intervals (three to six hours)* after the barbiturates, despite the respiratory depression and coma present, small doses (2.5 to 5 mg./kg.) of bemegride led to striking respiratory stimulation and often temporary awakening, generally accentuated by supplementary analeptics, but secondary fatal circulatory collapse often ensued. Similar results were also observed with the use of bemegride in experimental glutethimide (Doriden) poisoning.

Hæmodynamic effects of intravenous anæsthesia on man—Allen B. Dobkin (University of Saskatchewan, Saskatoon).

Hæmodynamic effects of seven intravenous anæsthetics were compared on seven young healthy males. Three of the drugs have been in use for many years in clinical anæsthesia (thiopental, thiamylal, and hexobarbital). Three others were recently introduced to clinical anæsthesia, but their value has not been established (buthalitone, methitural, and Dolitrone). The seventh drug is undergoing experimental evaluation (25398 Eli Lilly). All drugs in this investigation except Dolitrone are derivatives of barbituric acid.

Alterations in oxygen consumption, direct arterial and venous blood pressure, circulation time, cardiac output and derived circulatory parameters were presented for each drug. The statistical significance of these changes and the relationship of these changes to the lethal effects of the intravenous route of inducing anæsthesia are discussed.

Effects of vasodilator agents on hypovolæmic shock—M. Nickerson (University of Manitoba, Winnipeg).

Shock was induced in lightly anæsthetized dogs by bleeding from a femoral artery into a pressure regulating reservoir. After a period of stabilization at reduced pressure, the tubing connecting the animal to the reservoir was clamped and one of each pair of animals was injected with a vasodilator agent, dibenzyline or hydralazine. After an additional period of 1½ to 2 hours, all of the withdrawn blood was reinfused. Although the vasodilators could not cause an increase in circulating volume through uptake of blood from the reservoir, they increased survival and markedly increased the degree and duration of hypotension compatible with survival.

The acute oral toxicity of spiramycin—Carl E. Boyd and Eldon M. Boyd (Queen's University, Kingston).

Spiramycin, an antibiotic of the penicillin group effective mainly against Gram-positive organisms, had an acute oral LD50 of 9.4 + 0.8 g. per kg. body weight in albino rats and 5.2 + 1.6 g. in dogs, from which the

Canad. M. A. J.
Sept. 15, 1957, vol. 77

corresponding value in man may be estimated at 1 to 2 g. per kg. The clinical effects of these toxic doses by mouth were anorexia, vomiting (in dogs only), diarrhœa, and lassitude, progressing ante mortem to prostration, pallor, fall in body temperature, cessation of respiration, and death usually within 48 hours. At autopsy the stomach and intestines were acutely inflamed and distended. The cause of death was judged to be an acute, fulminating gastro-enteritis.

Histopathology of acute oral spiramycin poisoning—T. Michael, D. Brown and Eldon M. Boyd (Queen's University, Kingston).

After death due to administration of an acutely lethal oral dose of spiramycin to albino rats and dogs there was excessive necrosis and desquamation of the surface epithelium, especially of the small bowel and colon, in the gastro-intestinal tract. The tunica propria and submucosa exhibited acute and marked dilatation of the blood vessels. There was an acute necrosis of the hepatic cells and sinusoids of the liver (mostly central lobular) and of the (mostly distal) convoluted tubules of the kidney.

Chronic oral toxicity of spiramycin in the dog—Wilfred A. Cassell, Stanley Jarzylo and Eldon M. Boyd (Queen's University, Kingston).

Spiramycin administered by mouth in a dose of 0.5 g. per kg. body weight per day for eight weeks produced a systemic toxæmia in 10 dogs and death in eight of them. As the toxæmia developed, there appeared anorexia, vomiting, diarrhœa, irritability progressing to apathy, pallor, impaired vision, with ante-mortem prostration, rigor, greenish-black stools, and anal incompetence. Compared with 10 dogs used as controls and given no spiramycin, there was a progressive loss of body weight, a reduction of food intake, a progressively developing anæmia and lipopenia, and the appearance of albumin and bile pigments in urine during the last days of life.

Histopathology of chronic oral spiramycin poisoning—Eldon M. Boyd (Queen's University, Kingston).

Examination of organs removed at autopsy from dogs which died during the course of oral administration of spiramycin in a dose of 0.5 g. per kg. body weight per day, revealed a toxæmia affecting many systems of the body. The liver and kidneys were enlarged and œdematous, with nêcrotic changes in the hepatic cells and sinusoids and in the renal tubules. The spleen and adrenals were enlarged and œdematous and there was extramedullary hæmatopoiesis in the spleen. The testes had lost weight, and tissue water and spermatogenesis was inhibited or, in some seminiferous tubules, completely suppressed. Pigment was lacking in the choroid layer of the eye. Zymogenic granules were lacking in the acinar glands of the pancreas. Epithelium lining the thyroid follicles was flattened. The thymus was atrophied. Skeletal muscle took up stain poorly and cross striations ("A" discs) were less in evidence. Minor or no evidence of toxic influence was noted in stomach, jejunum, cæcum, colon, cerebrum, cerebellum, skin and ovary. It was estimated that a similar toxæmia might be produced in man by oral administration of spiramycin in a dose of 0.25 g. per kg. body weight per day after several weeks of treatment.

Hydrolipotropic shifts in the mesentery of albino rats bearing Walker carcinosarcoma 256—Harold E. W. Binhammer and Eldon M. Boyd (Queen's University, Kingston).

The mesentery of albino rats bearing Walker carcinosarcoma 256 was found to lose weight at a rate greater than that of host carcass (host minus tumour). The shrunken mesentery of the tumour-bearing rats contained lower *absolute amounts* of total lipid, total fatty acids, neutral fat, total cholesterol, free cholesterol, phospholipid, water, and nonlipid dry weight, than were present in mesentery of nontumour-bearing twins. The *level* of neutral fat, expressed as g. per 100 g. nonlipid dry weight, was lowered, but the *levels* of phospholipid, total cholesterol, free cholesterol, and water, per unit nonlipid dry weight, were very markedly *increased* in mesentery of the tumour-bearers over levels in nontumour-bearers. The shifts in levels of lipids and water were greater than those seen in the whole carcass (minus tumour) of the host rat. The shifts in mesentery occurred in animals bearing tumours which were 20 to 40% of host weight with no appreciable correlation with further tumour growth. By elimination, it was concluded that the shifts in levels of lipids and water occurred mostly in the connective tissue of mesentery. This indicated, in turn, the probability that shifts in levels of lipids and water in host carcass are due mostly to shifts in skeletal muscle and connective tissue.

Hypoglycæmic action of some 2-sulfonamido-5-alkyl-1, 3, 4-thiadiazole derivatives—J. D. McColl, Grace Eperson, F. L. Chubb and Jacqueline Nissenbaum (Frank W. Horner Ltd., Montreal).

A series of 2-(p-toluene sulfonamido)-5-alkyl-1, 3, 4-thiadiazoles and 2-(p-methoxybenzenesulfonamido)-5-alkyl-1, 3, 4-thiadiazoles were prepared. The alkyl substitutes were n-butyl, isobutyl, t-butyl, n-amyl and isoamyl.

The hypoglycæmic action of these compounds was compared with tolbutamide over a six-hour period in the rabbit following oral dosage. Hypogylcæmia occurred during the second and reached a maximum during the fifth hour after administration. Of the alkyl substituents the t-butyl and isobutyl were the most active, followed in decreasing order by n-amyl, n-butyl, and isoamyl. In general the p-methoxy derivatives were less toxic and more active than the corresponding p-methyl analogues.

The 2-(p-methoxybenzenesulfonamido)-5-t-butyl-1, 3, 4-thiadiazole was observed to have hypoglycæmic activity of the same order as tolbutamide in the rabbit.

Toxicity of anticoagulants—L. B. Jaques (University of Saskatchewan, Saskatoon).

The major toxic effect of anticoagulants is hæmorrhage due to overdosage. However, normal animals can be maintained on high doses of anticoagulants for many weeks without any evidence of hæmorrhage and clinically there appears to be no relationship between the level of effectiveness of the anticoagulant as judged by clotting time or prothrombin time and the appearance of hæmorrhage. A series of rabbits were subjected to various stress agents (cold injury, insulin shock, 10% sodium chloride intraperitoneally) when receiving anticoagulants (dicoumarol, phenylindanedione, heparin) when subjected to a stress agent; 50% of animals receiving dicoumarol or phenylindanedione died of hæmorrhage.

CANADIAN PÆDIATRIC SOCIETY

At the meeting of the Canadian Pædiatric Society in the Royal Alexandra Hotel, Winnipeg, June 12-15, the scientific sessions were highlighted by a round-table discussion on "Whither the Pædiatrician?" which was chaired by Dr. A. F. Hardyment of Vancouver. This produced considerable interest and debate from the floor. Dr. Willis Potts from Chicago honoured the

meeting by presenting a provocative paper on "Patent Ductus Arteriosus and Pulmonary Hypertension". Dr. Douglas Geiger of Toronto presented the newer aids in diagnosis of fibrocystic disease with special reference to increase in sweat electrolytes. A simple qualitative technique of determining these by thumb-printing and chemical staining of the sweat thus obtained, was outlined. Members of the Northwest Pediatric Society of the United States attended the meeting and of this group Dr. A. C. Anderson of Minneapolis read a paper on "Corrected Transposition of the Great Vessels" in which he described a series of infants with transposition of the aorta and pulmonary artery with inversion of the ventricles and atrio-ventricular valves. Other cardiac abnormalities were present as well. Dr. Haddow Keith of Rochester, Minn., gave a review of his experiences in the use of "Celontin in the Treatment of Convulsive Disorders". The final morning was devoted to a series of excellent papers given by the staff of the Winnipeg Children's Hospital.

At the Annual Business Meeting of the Canadian Pædiatric Society, the following officers were elected for the year: President; Dr. Stephen Weyman, Saint John, N.B.; Vice-President: Dr. Antoine Larue, Quebec City, P.Q.; Directors: Dr. A. F. Hardyment, Vancouver; Dr. Brock Armstrong, Edmonton; Dr. Stanley C. Best, Regina; Dr. Harry Medovy, Winnipeg; Dr. Donald R. Clark, Peterborough; Dr. W. W. Tidmarsh, Montreal; Dr. Gordon B. Wiswell, Halifax; Dr. J. H. O'Hanley, Charlottetown; and Dr. T. G. Anderson, St. John's, Nfld. Dr. J. A. P. Turner, Toronto, was re-elected as Secretary-Treasurer.

CANADIAN CONFERENCE ON PHARMACEUTICAL RESEARCH

On August 9, 1957, at the University of Montreal the Rector Monseigneur Irénée Lussier, P.D., welcomed a group of 90 industrial pharmacists, research workers and graduate students to the fourth Canadian Conference on Pharmaceutical Research. This annual conference, sponsored by the Canadian Foundation for the Advancement of Pharmacy and the Canadian Conference of Pharmaceutical Faculties, enables scientists engaged in the pharmaceutical industry, the Food and Drug Directorate and Canadian Colleges of Pharmacy to present papers and exchange discussions on some of the newer developments in pharmaceutical research.

Preliminary extraction studies as part of a "Phytochemical Investigation of *Ornithogalum umbellatum*", conducted by the Faculty of Pharmacy, University of Toronto, were reported by Dr. G. R. Paterson. Earlier studies by Dr. R. A. Waud, Department of Pharmacology, University of Western Ontario, confirmed the presence of a cardiotonic principle in the bulbs of the plant commonly known as Star of Bethlehem. Clinical trials on carefully selected cases of congestive failure were conducted by A. Vogelsang, who used enteric coated tablets standardized against digitalis. In comparison with digitoxin, the extracted drug was observed to produce less slowing of the heart rate, increased excretion of body fluid by the kidneys, increased cardiac contraction and less nausea. Several methods of drug extraction have been successful, but, according to the University of Toronto group, the most potent preparations have resulted from an acetone extraction, prepared with an ultrosonics generator. Preliminary attempts to purify the extracts by chromatographic means were also reported.

Research on two new antitussive agents has been conducted by Ayerst, McKenna and Harrison, Ltd. and British Drug Houses, Ltd. The dimethylaminoethoxyethyl ester of phenothiazine carboxylic acid was discussed by C. I. Chappel in a paper entitled "Pharmacological Studies on New Synthetic Antitussive Agents". Dr. Bohdan Barna read a paper prepared by R. E. Stuckey, British Drug Houses Ltd., England, on "The Analytical Chemistry of Oxeladin". The diethylaminoethoxyethyl ester of $\alpha\alpha$-diethylphenylacetic acid (oxeladin) appears to possess similar activity to carbetapentane, which it resembles structurally, and to be slightly less active than codeine phosphate. Sensory nerve endings in the trachea and bronchial tree are not the site of action and acute toxicity is not significantly different from that of carbetapentane. The ester also has local anæsthetic properties and only excessive amounts appear to have a constipating effect in normal mice. A spasmolytic effect has been demonstrated with the isolated guinea pig ileum and isolated rabbit duodenum. Intravenous injection in the anæsthetized cat produced a transient fall in blood pressure of the same magnitude as that produced by codeine phosphate. No untoward effect on the growth rate and the hæmatopoietic system was noted when oxeladin was administered to rats over a prolonged period. Clinical trials on 35 infants and children, ranging in age from one year five months to 11½ years, are reported by Dr. C. T. Roberts in the March 1957 issue of the *Practitioner*. Administration of the preparation, now available in England under the trade name of "Pectamol", was reported by Dr. Roberts to be facilitated by its marked palatability. Absence of such side-effects as drowsiness, anorexia or constipation was also mentioned.

A study of the "Influence of Sorbitans on the Dispersion of Crude Coal Tar in Ointment Bases" has been undertaken by J. M. Dykeman and G. A. Groves of the Faculty of Pharmacy, University of British Columbia. The best results were obtained with 0.5%-5% Tween 80, which was mixed with the crude coal tar before incorporation into the base. Experiments conducted with paraffin, cold cream, lyophilic ointment, C.F., and hydrophilic ointment, U.S.P., showed better dispersion and improved washability.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

D. G. Chapman, L. G. Chatten and J. A. Campbell, Department of National Health and Welfare, Ottawa, reported continued study of the "Relationship between Disintegration Time and Physiological Availability of Drugs in Tablets".* Multivitamin tablets, enteric coated tablets and delayed action preparations are now being investigated.

The fifth Conference on Pharmaceutical Research will be held in Edmonton in 1958 in conjunction with the Annual Convention of the Canadian Pharmaceutical Association.

*See p. 602 of this issue.

NINTH INTERNATIONAL CONGRESS OF RADIOLOGY, 1959

The Ninth International Congress of Radiology will take place in Munich, Germany, between July 23 and 30, 1959. The International Committee has elected Professor Boris Rajewsky of Frankfurt-on-Main as president. Professor Hans von Braunbehrens of Munich is to be general secretary. Dr. Viktor Loeck will act as director of the Congress Secretariat. Information about the Congress from the Congress Secretariat, Frankfurt-on-Main, Forsthausstrasse 76, West Germany.

PUBLIC HEALTH

INFLUENZA

Through the courtesy of the Federal Department of National Health and Welfare, we are able to print some epidemiological notes (from the World Health Organization) on the current epidemic of Asian influenza.

Reports received up to August 15 indicate new outbreaks of the disease in Mexico, Tanganyika and New Zealand. A/Asian/57 influenza virus has been identified in the Union of South Africa and New Zealand. The disease was reported at that date to be spreading in Australia, Egypt and the United States of America, and to be still mild in character. Egypt reported 19,700 cases in a week with no deaths; the Sudan reported over 40,000 with one death. The Union of South Africa reported that A/Asian/57 virus has been isolated from cases of influenza. In the United States of America, influenza or influenza-like disease continues to be reported from various parts of the country. The exact extent of the illness due to the new type of influenza A is difficult to determine. A small outbreak in Mexico City has been confirmed by virus isolation, and the virus has also been isolated from a small outbreak in the U.S.A. among Mexican nationals. Some of the reports from Asia suggest that the epidemic is on the decline. This applies to such areas as Burma, North Borneo, Indonesia, Iran and West New Guinea. The only European report is from the Netherlands, where the general population remains little affected, although the disease had spread to 43 out of 70 camps by August 10; it continues to be mild. In Australia infection has spread more rapidly in Queensland than in other parts. The A/Asian/57 virus has been repeatedly isolated. In New Zealand the disease is spreading rapidly, but is clinically mild.

U.S.A.—A report from New York on August 23 describes an outbreak of influenza among foreign exchange students arriving in New York on August 12. Before arrival there had been 150-200 cases of influenza with temperatures up to 104° F., red throat, headache and general malaise. One 17-year-old boy developed pneumonia and cardiovascular collapse and died. At autopsy, consolidation of the lungs was found, and specimens of lung and heart tissue contained an Asian strain of influenza A virus. Further isolations of this virus are reported in Michigan, New York State, California, Louisiana and Oregon. Mortality data from 114 cities in the U.S.A. reveal no evidence so far of any increase attributable to influenza.

REPORTING EPIDEMIC OR UNUSUAL COMMUNICABLE DISEASES

The attention of general practitioners is drawn to the fact that, apart from the obligatory reporting of certain infectious diseases, medical health officers will welcome information on any type of epidemic or unusual communicable disease. A surveillance report of epidemic or unusual communicable diseases now exists for the use of medical health officers reporting to provincial health departments. This includes such information as the diagnosis of the epidemic condition (if known) or at least a clinical description of the disorder, the place or area of occurrence, the approximate number of cases, or the proportion of population affected, the date of the first occurrence and any other relevant data. Practitioners are asked to co-operate with medical health officers in collecting data on local epidemics of such conditions as unusual types of respiratory disease.

LETTERS TO THE EDITOR

NUFFIELD BIRTHDAY FUND

1 Wimpole Street,
London, W.1.

To the Editor:

On 10th October next, Lord Nuffield celebrates his 80th birthday. As is well known, Lord Nuffield is the greatest benefactor to medicine Britain has ever known, and there can be few medical men and women who have not benefited, directly or indirectly, from his gifts.

It seems fitting to us that, on the occasion of his 80th birthday, members of the medical profession should have an opportunity of showing the regard which they have for Lord Nuffield, and their gratitude for his farsighted generosity.

With this in mind, we write to ask you to contribute, however modestly, towards a birthday present which we propose to give Lord Nuffield as a tribute from the profession, both at home and in the Commonwealth, at some celebration to be held in London or in Oxford near the date of his birthday.

It is our intention to buy a present for Lord Nuffield from the money subscribed, and to give him the balance to use as he wishes.

A maximum donation of about two guineas is suggested, but any amounts, either larger or smaller, will be very acceptable. Donations of even a few shillings would be welcome, for the important thing is that Lord Nuffield should know that the present comes from the profession as a whole.

We earnestly ask you to send a contribution.

Cheques and postal orders should be made payable to the Nuffield Birthday Fund, and sent to 1, Wimpole Street, London, W.1, as early as possible.

Yours sincerely,

W. Russell Brain
Henry Dale (Trustee)
Evans
R. R. Macintosh
W. N. Pickles
Harry Platt
Arthur Porritt
Charles D. Read
Clement Price Thomas (Trustee)

SURGICAL TRAINING

To the Editor:

I have been directed by the Council of The Royal College of Physicians and Surgeons of Canada to transmit to you the following Resolution which was approved by the Council at their last meeting on June 22, 1957:

"Resolved that The Royal College of Physicians and Surgeons of Canada place itself on record as being opposed to the apprenticeship training of general practitioners in the technique of a limited number of surgical procedures as outlined in the *Canadian Medical Association Journal*, 75: 1037, December 15, 1956, under the heading 'A Surgical Program for General Practitioners'. This College has believed for many years that a minimum period of five years of formal postgraduate training is required to make a doctor a reasonably safe surgeon, and its standards have had almost universal acceptance in this country. The technical aspect of a surgeon's training is only a minor part of surgical training and to suggest that a program of supervised but very slight experience in a limited number of operations renders a man capable of undertaking the total responsibilities of surgery in the fields mentioned (which include the abdomen) is to give a false impression to the man himself and to the lay public. It is obvious that men with such meagre training could not be safe or competent and hospital boards should be made aware of the dangers which are involved in extending even limited surgical privileges in hospitals on the basis of such training."

James H. Graham, F.R.C.P.[C.],
Secretary.

150 Metcalfe St.,
Ottawa 4, Ont.,
August 14, 1957.

HEALTH EDUCATION

To the Editor:

Editorial comment in your issue of July 15, 1957, on "Health Education of the Public" appears to reflect some misconceptions of the principles, work, and methods of (non-medical) health education specialists in health departments and voluntary health agencies.

The assumption appears to be that health education is largely a matter of supplying information, particularly when it is given apart from giving personal service. It has been abundantly demonstrated that information and knowledge are not enough and that there must be motivation and involvement. If health educators were to have no other contacts with the public than by means of mass media your surmise might have been closer to the truth. The fact is, however, that ideally the health educator works with existing organizations in the community and otherwise with many small groups, and even individuals, to help them to appreciate desirable health goals and to achieve them.

The assumption that the health educator is not likely to give personal service or have personal contacts is therefore not entirely correct, either. The health educator gives a service when he indicates to any person or group of persons how they may best recognize and deal with problems of personal and community health.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

In the ideal situation there is close teamwork in the health agency, with the health educator's skills supplementing those of the physician, the nurse, the dentist, the nutritionist, the psychologist, the psychiatrist, and others who may be team mates.

Health educators wisely depend upon physicians for scientific accuracy, but this is advisable for all team members, including nurses. Perhaps it is not unfair to say that the health educator is usually one of the best trained and most educated (academically) on the team.

One of the important difficulties facing the health educator in a public health department today is the lack of direction from physicians in supervising positions. Too many of our medical health officers have not been given adequate preparation for health education as a part of their responsibilities and are unable to give wise direction. Moreover, some physicians have shown lack of enthusiasm for health education, which often demands long hours and tiring tasks.

That there are not many more health educators at work in Canada today is due in part to the above reasons, and also perhaps non-acceptance of the proposition that in a democratic society public health endeavour can succeed only among an informed, involved public.

CHRISTIAN SMITH,
Director of Health Education.

Department of Public Health,
Provincial Health Building,
Regina, Sask.,
August 21, 1957.

To the Editor:

From the extraordinary differences in opinion in the editorial on Health Education in your number of July 15 and the letter by Mr. R. R. Robinson, in the issue of August 15, one gathers that until there is a better understanding of the matter, there will continue to be a great deal of talking at cross purposes. Of the supreme importance of health education, there can be no doubt. The late Dr. C. J. O. Hastings, most famous of all Canadian medical officers of health and for many years a practising physician in Toronto, once said that the whole future of public health depends on education. Dr. Hastings referred to individual health as well as public health, since the health of the whole depends on the health of the part.

The objective of health education then is to decrease illness, promote health and prolong life, and by implication mass education as well as personal education is necessary.

It seems to me that a great deal of confusion has been caused by whoever coined the term "health educator" and tied it largely to persons who generally lack education in the basic medical sciences. How in the world it can possibly be suggested that a young person, trained in journalistic and publicity techniques but untrained in the essentially medical and allied sciences, should be called a health educator, while a physician after years of intensive and specialized study of the cause, prevention and cure of disease should be considered a mere bystander, unworthy and unable to educate, is beyond the thinking of a logical person.

It was Dr. George Vincent, President of the Rockefeller Foundation, who stated some 20 years ago that the ultimate health officer is the practising physician. The famous Dr. George Crile of Cleveland made a similar statement to the effect that the primary function of the physician is prevention. Dr. Walter G. Smillie, Professor of Preventive Medicine at Cornell University, in his text book on preventive medicine emphasizes the same point and since the first principle of prevention is education the real health educator must be the physician, though specialists in allied sciences have their place.

The fault I have to find with Mr. Robinson's attitude is his mis-application of the term "health educator". His definition seems to freeze the practising physician out altogether. One must confess that the so-called codes of medical ethics which seem to assume that every time a doctor gives a speech or is quoted on a medical subject in a newspaper, he is trying to steal patients from his fellow practitioners, have unfortunately given the impression that physicians are governed by the idea that the less their patients know about health and disease the better for everybody. As a matter of fact the official health officer, whose first function must be health education, owes his very position to his medical training; and outdated codes of ethics which prevent the doctor from undertaking the duty of the education of his patients and the public should be relegated to the limbo of outmoded and decaying tradition.

The type of person to whom Mr. Robinson refers as a health educator is really a public relations officer with special training in a particular field. If Mr. Robinson's conception is correct, then we will soon have paint educators and sewage disposal educators and dry goods educators, and the paint manufacturers and the engineers and the dry goods merchants will be denied the right to even pose as experts on their own products.

If ancient codes of ethics persist and the general practitioner is therefore forced to deny to the public and his patient the knowledge which he is best fitted to supply them, one can only say: "God help the medical profession." If the doctor is forced to dodge his duty in educating his fellow man in the principles of preventive medicine, then one must wonder whether it is not right and fitting that the State take over and do his education for him. Then, indeed, anyone can be a health educator and be paid for his work.

GORDON BATES, M.D.,
General Director,
Health League of Canada.
111 Avenue Road,
Toronto 5, Ont.,
August 29, 1957.

B.M.A. - C.M.A. Conjoint Annual Meeting

Edinburgh, July 18 - 25, 1959

INFORMATION FORM

NAME.....

ADDRESS.....

I shall be accompanied by.....

(If any children please state their sex and present age) .....

I prefer to travel by ship .....
by air ..... (a) regular schedule
..... (b) charter flight

I prefer to travel First Class .....
Tourist Class .....
Cabin Class .....

Ships from Canada have only two classes (First and Tourist). Ships from New York also carry Cabin Class.

I prefer to leave from Montreal .....
Quebec .....
New York .....

In addition to Edinburgh, I wish to visit the following:

England	Russia	Portugal	Germany
Holland	Hungary	Denmark	France
Switzerland	Ireland	Czechoslovakia	Norway
Spain	Belgium	Yugoslavia	Finland
Sweden	Italy	Scotland	Austria

I wish to travel on a conducted tour. Yes..... No.....

I prefer independent, arranged travel. Yes..... No.....

I wish to rent a self-drive car. Yes..... No.....

I wish to travel by chauffeur-driven car Yes..... No.....

I wish to travel on motor coach tours. Yes..... No.....

I expect to be absent from Canada for.....weeks.

I prefer to arrange my tour in advance of the Edinburgh meeting.....
after the Edinburgh meeting.....

I understand that accommodation in Edinburgh will be available, Saturday, July 18 to Saturday, July 25.
I am prepared to accept the housing assigned by the B.M.A. Committee. My preference is for:

Hotel..... Rooming house..... Private hospitality.....
(Please indicate in numerical order)

I wish to leave Canada in April .....
May .....
June .....
July .....

I wish to return to Canada in July .....
August .....
September.....
October .....

I wish the following class of land travel. De luxe .....
Standard .....
Thrift .....

On De luxe travel, rooms have private baths throughout—hotels are all de luxe and first-class.
On Standard travel, rooms have private baths wherever available—hotels are all first-class.
On Thrift travel, small, comfortable, specially chosen hotels are used. Rooms do not generally have private baths.

My local travel agent is.....

.....

IT IS CLEARLY UNDERSTOOD THAT THE COMPLETION OF THIS FORM IN NO WAY BINDS ANY MEMBER OF THE CANADIAN MEDICAL ASSOCIATION

Please complete and return this form to:

UNIVERSITY TOURS LIMITED, 2 College Street, Toronto.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

OBITUARIES

DR. JOSEPH J. GUERTIN, district coroner for Richelieu, Que., died at the Hotel Dieu Hospital, Sorel, after a short illness. He was 83 years of age.

Dr. Guertin obtained his medical degree at Laval University in 1903. In 1954 the College of Physicians and Surgeons of the Province of Quebec conferred on him their honorary diploma on the occasion of the fiftieth anniversary of his starting medical practice. At the time of his death he had practised in Sorel and St. Joseph de Sorel for 54 years. He had held appointments as medical officer of several companies and as port medical officer in Sorel. He was appointed district coroner in 1944.

He is survived by his widow, one daughter, and one son.

DR. ALICE MARY HAWKER, 87, formerly a medical missionary in India, died in Vancouver in July. After qualifying in medicine, Dr. Hawker was sent out to India by the London Missionary Society in 1899, and served there for 38 years. Her parents also served as missionaries in India. After her retirement in 1937, she went to live in Vancouver.

She is survived by a sister and a niece.

DR. WILFRID J. HOLLEY, 47, of Brantford, Ont., was killed in a car crash on August 16.

Dr. Holley was born in Woodstock and graduated from the University of Western Ontario in 1937. He served an internship at Victoria Hospital, London, and undertook postgraduate training in pathology in Vancouver. In 1942 he became staff pathologist at the Brantford General Hospital. In 1943 he joined the Royal Canadian Army Medical Corps and served until 1945; during this period he set up laboratories in the army services. He resumed his duties at the Brantford General Hospital in 1945, and was appointed a provincial pathologist in 1952; in addition, Dr. Holley was pathologist to the Willett Hospital, Paris, Ont.

He is survived by his widow and one son.

DR. DANIEL E. LECAVALIER, 87, who founded Canada's first antituberculosis clinic, in Montreal, died in July. Dr. Lecavalier, who was born in St. Laurent, Que., was well known in Europe and the United States as well as in Canada. He was president of the Canadian Society of Paris, and represented Canada at the International Medical Congress in Moscow in 1897 and in Paris in 1900; he was prize-winner of the International Society of Tuberculosis and correspondent of the Therapeutic Society of Paris. Dr. Lecavalier was one of the founders of the Montreal Medical Society and the Ligue des Propriétaires de l'Est, of the *Montreal Medical Journal*, and of the only medical journal published in French in the United States, *La Revue de Médecine franco-américaine*. He was vice-president of the International Congress of Tuberculosis at St. Louis, Mo.

His writings included medical books, and papers published in many journals.

He is survived by three sons and two daughters.

ABSTRACTS *from current literature*

MEDICINE

Detection of Intracranial Metastasis in Lung Cancer: A Comparative Study of the Neurological Examination and the Electroencephalogram.

J. K. SMITH: *J. Thoracic Surg.*, 33: 814, 1957.

Out of a group of 27 cases of bronchogenic carcinoma studied during life both by clinical neurological examination and electroencephalogram, and with complete autopsy, the brain was involved in 15. The neurological examination failed to predict involvement *in only one* of these cases, while the electroencephalogram missed six (four of them in the cerebellum). In two additional cases where the brain was uninvolved, the electroencephalogram suggested lateralized intracranial abnormality while the neurological examination was negative. In four of the patients with clinical evidence of brain involvement, this was the only apparent indication that the disease had spread beyond the lung.

This study indicates the value of a careful neurological evaluation of prospective candidates for removal of a malignant lung tumour. It seems clear, moreover, that while the electroencephalogram is a useful aid in confirmation it should not be depended upon in itself as a screening technique.

S. J. SHANE

Some Clinical Entities Associated with Sporadic Infection with Adenoviruses in Adults.

E. JAWETZ: *Ann. New York Acad. Sc.*, 67: 279, 1957.

The advent of new simple methods for the isolation of viruses in tissue culture has greatly speeded the discovery of a vast number of "new" viruses from many different areas of the human body. The problem will be not to find viruses, but to decide which of them should be considered members of a "normal viral flora" corresponding to the well-established normal bacterial flora and which should be primarily associated with disease. We are discovering increasing numbers of viral agents that are "in search of disease".

When the first adenoviruses were discovered in cultures prepared from adenoidal and tonsillar tissues it seemed probable that they, too, might be predominantly "orphans". The subsequent identification of Type 3 as the etiological agent causing epidemic pharyngoconjunctival fever in children, and the discovery that the RI-67 virus (adenovirus Type 4) caused large outbreaks of respiratory disease in military recruits, indicated that at least some adenoviruses were pathogens of considerable stature. The present report attempts to show that this might be true for many of the known adenovirus types, including some, such as Types 2 and 6, that have not often been isolated from disease. It also indicates that sporadic infections of adults are by no means rare.

The question arises as to whether specific symptom complexes or clinical entities might be associated with infection by specific types of adenovirus

agents. Because of the paucity of clinical observations, an answer is evidently not possible at this time.

The majority of the proved sporadic adenovirus infections in adults have shown involvement of the eye. In some, the eye was the only site of manifest viral activity; in others, it was associated with systemic or respiratory symptoms. The constancy of eye involvement raises the question whether the eye may not serve as the portal of entry for the virus. This thought is suggested by the great difficulty in infecting volunteers with adenoviruses via the respiratory tract and the relative ease of obtaining infection when virus is applied to the conjunctivæ. Furthermore, there have been observed instances in which conjunctivitis was the first symptom noted, definitely preceding systemic symptoms by several days. It is quite possible that, in civilian practice, adenovirus infections of adults may manifest themselves frequently as eye infections rather than as respiratory diseases. S. J. SHANE

Further Experiences with the Vigorous Diagnostic Approach to Upper Gastrointestinal Hæmorrhage.

E. D. PALMER: *Am. J. M. Sc.*, 233: 497, 1957.

A series of 238 patients with upper gastro-intestinal hæmorrhage was managed by the vigorous diagnostic approach, which calls for physical, œsophagoscopic, gastroscopic and roentgenologic examinations during active bleeding as soon as the patient is encountered. A specific diagnosis of the responsible lesion was established quickly in 88.7% of the cases. Subsequently 6 of the diagnoses were found to be incomplete or incorrect. Treatment included emergency operation in 48 instances; in all but 3 the operative plan based on the preoperative diagnostic study proved to be proper and was carried out. The gross mortality rate was 8%; the mortality rate for exsanguination was 3%.

The writer considers that upper gastro-intestinal hæmorrhage makes a desperate demand for quick and accurate diagnosis because specific therapeutic measures are available for many of the responsible lesions. In this emergency, he feels that diagnostic reticence is to be condemned; it can stem only from baseless fear of harming the patient; yet, as in many other clinical emergencies, the harm results from failure to attempt diagnosis rather than from efforts exerted in the patient's behalf. S. J. SHANE

Value of Serum Aminopherase Determinations in Suspected Acute Myocardial Infarction.

S. KRAUSE: *Dis. Chest*, 31: 512, 1957.

The best present evidence indicates that determination of the level of transaminase activity in the serum should not be used to replace electrocardiography but to supplement it. It is of value when the diagnosis of acute myocardial infarction is suspected clinically but cannot be confirmed electrocardiographically. This situation frequently arises when a history suggestive of an acute coronary occlusion is obtained and the electrocardiogram is recorded too early for changes to appear. Or the electrocardiogram, though abnormal, may not be completely diagnostic of recent myocardial injury but exhibit equivocal changes usually consisting of minor ST deviations or T wave inversions. Severe chest pain, particularly that following an operative procedure, will raise the question of a differential diagnosis between acute pulmonary embolism or an acute coronary occlusion, and neither the electrocardiogram nor chest radiograph may be helpful in arriving at a decision. An elevated serum transaminase level, however, will clarify the issue by shifting the evidence in favour of the latter. Not uncommonly the electrocardiographer is confronted with a tracing that shows the pattern of left bundle branch block when acute myocardial infarction is suspected. Since conduction defects of this type can obscure the electrical signs of recent myocardial injury, the presence of an elevated serum transaminase level may prove of value. Another application of this laboratory test is in the identification of recent myocardial injury superimposed on the residual signs of old cardiac damage—a situation which may "neutralize" the characteristic changes produced by injury currents. The early appearance of an elevated serum transaminase value can confirm the clinical impression of additional myocardial damage. Also, serial serum transaminase determinations may help confirm or rule out recent myocardial damage when the electrocardiographic interpretation is complicated by an arrhythmia such as ventricular tachycardia where the contour resembles that of a recent infarct. Serial determination of the serum transaminase activity may also be of considerable value in assisting one to distinguish the electrocardiographic pattern of myocardial infarction from that of pericarditis or digitalis effect. Thus, if serum transaminase levels are obtained early enough, and in a serial fashion following suspected myocardial infarction, a normal value is just as important in ruling out the presence of this lesion as an elevated value is in confirming the clinical impression. S. J. SHANE

Myocardial and Valvular Factors in Rheumatic Heart Disease with Mitral Stenosis.

L. A. SOLOFF *et al.*: *Am. J. M. Sc.*, 233: 518, 1957.

Twenty-five persons with rheumatic heart disease, mitral stenosis and dyspnœa were studied by the combined techniques of cardiac catheterization and sequential venous biplane stereoscopic angiocardiography. The findings permitted separation into groups which are of value in estimating the significance of myocardial and mitral obstructive factors in the production of disability. Common to all groups were enlargement of the left atrium and prolongation of its duration of opacification.

Group I included those with normal right heart time and normal intracardiac circulation time. These could be divided into those with: (a) normal pulmonary artery and wedge pressures; (b) elevated pulmonary artery and normal wedge pressures; (c) elevated pulmonary artery and wedge pressures.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

Group II included those with normal right heart time and prolonged intracardiac circulation time. These could be divided into those with: (a) normal pulmonary artery and wedge pressures; (b) elevated pulmonary artery and normal wedge pressures; (c) elevated pulmonary artery and wedge pressures. In the latter significant mitral block was present, and myocardial dysfunction was also occasionally present.

Group III included those with prolonged right heart time and prolonged intracardiac circulation time. These could be divided into those with: (a) normal pulmonary artery and wedge pressures; (b) elevated pulmonary artery and normal wedge pressures; (c) elevated pulmonary artery and wedge pressures.

Medical therapy is indicated in this group to abolish or reduce myocardial dysfunction.

The longer the residual circulation times and the lower the pulmonary vascular pressures, the more significant are the myocardial factors and the less significant the obstructive ones. This is particularly so if the right heart time exceeds the prolonged intracardiac circulation time. In any group, the larger the left atrial or cardiac volumes or both, the greater is the significance of myocardial factors.

S. J. SHANE

Transfusion Reactions in the Absence of Demonstrable Incompatibility.

H. FUDENBERG AND F. H. ALLEN: *New England J. Med.*, 256: 1180, 1957.

The potential dangers of blood transfusion are numerous. For this reason transfusions should be given only when really necessary. Even the most careful grouping and cross-matching may fail to prevent serious reactions and even minor abnormalities in such tests should be carefully regarded. Hæmolytic transfusion reactions may occur in women who have had pregnancies or in any patient who has had previous transfusions, even though the most careful available methods have been employed in the laboratory to determine compatibility.

The authors present case histories and experimental work to validate their conclusions. They recommend the utmost care in cross-matching and the use, whenever possible, of auto-transfusions (use of the patient's own blood, taken two or three days before anticipated use, and not requiring any testing for suitability).

NORMAN S. SKINNER

Atypical Syndromes in Hyperthyroidism.

M. G. WOHL AND C. R. SHUMAN: *Ann. Int. Med.*, 46: 857, 1957.

The occurrence of atypical syndromes in hyperthyroidism is of extreme importance, since they frequently result in an error in diagnosis when their nature is not recognized. In some patients the characteristic features of thyrotoxicosis are overshadowed by other prominent physical findings, thus diverting attention from the possibility of an underlying metabolic disturbance. The many systemic effects related to excessive thyroxine secretion involve the cardiovascular, gastro-intestinal, cerebral, neuromuscular, hepatic, renal and osseous structures. The clinical manifestations of thyrotoxicosis may be specifically related to any one or several of these systems, because of the influence of the hormone upon their function.

In this study, six patients with hyperthyroidism are described whose presenting signs and symptoms were referable to one organ system: cardiovascular, gastro-intestinal or central nervous systems. Since the usual signs of hyperthyroidism were lacking, they were treated unsuccessfully for months without the suspicion arising that the real trouble was an overactive thyroid gland. Careful, painstaking scrutiny of the patient, aided by appropriate laboratory studies, revealed the underlying thyrotoxicosis, and proper treatment brought about amelioration of symptoms and complete recovery.

S. J. SHANE

SURGERY

Spigelian Hernia.

D. BAILEY: *Brit. J. Surg.*, 44: 502, 1957.

Hernia in the linea semilunaris and spontaneous lateral ventral hernia are alternative names for Spigelian hernia. The linea semilunaris was first described by Adriaan van der Spieghel of Padua (1578-1625). Klinkosch first described the hernia and gave it its name in 1764. The hernia is through the aponeurosis of the transversus joining the muscle belly to the rectus sheath and most often at the level of the semilunar fold of Douglas. The sac, covered with extraperitoneal fat, spreads between the internal and external oblique muscles. Strangulation is common because the neck is so rigid and small. It may occur at any age, but Sir Astley Cooper's "corpulent gentleman advanced in years" is the typical case.

The diagnosis can be made if the condition is borne in mind. It is sometimes the cause of pain in the right lower quadrant. The symptoms are out of proportion to the size of the hernia. Occasionally there is a demonstrable lump that comes and goes, but the mass is usually masked by the aponeurosis of the external oblique and the diagnosis may be quite obscure. Treatment is surgical.

BURNS PLEWES

Failure of Cardio-Pericardiopexy to Protect Pigs Against Acute Coronary Occlusion.

H. GROSS *et al.*: *J. Thoracic Surg.*, 33: 679, 1957.

In this study no beneficial effects resulted from the use of talc cardio-pericardiopexy to protect *the pig heart* against subsequent ligation of the coronary arteries.

Pericardial adhesions develop wherever talc powder was insufflated. The adhesions were dense and so avascular that when they were cut no bleeding resulted. They were so firm that they had to be cut by sharp dissection; when cut by blunt dissection, atrial tears frequently resulted.

During the period of observation, there was no histological or gross evidence of increased collateral

circulation. The experimental animals did not survive any longer than the controls regardless of the duration of talc instillation.

The burden imposed on the coronary circulation by these experiments was great. The ligations were sudden, complete and high, 2 cm. or less distal to the bifurcation of the left coronary artery. Since there was no stimulus for the development of a coronary collateral circulation in the animals by progressive coronary narrowing, the burden on the coronary circulation and the test of the effectiveness of pericardiopexy were great.

These experimental conditions do not completely mimic the course of human coronary artery disease. In man, the greatest stimulus to a collateral circulation is progressive coronary narrowing. Indeed, when the collaterals are well developed, occlusions of one or both major coronary arteries may be well tolerated. Sudden hæmorrhage into a plaque of a coronary artery close to the bifurcation, when coronary disease is local, is usually fatal in man. This latter clinical condition was simulated in the experiments performed. S. J. SHANE

Cross-finger Pedicle Flap in Hand Surgery.

R. M. CURTIS: *Ann. Surg.*, 145: 650, 1957.

When skin and subcutaneous tissue are lost from a finger so that tendon or bone is exposed, there are great advantages in a pedicle graft from an adjacent finger. The functional and cosmetic result is superior. Only two fingers are immobilized for 10 to 14 days. Hospitalization is not really necessary. There is little worry about loss of skin flap. There are disadvantages, especially the danger of slight residual stiffness in the normal donor finger, and the method is not to be done without indication.

The technique of such pedicle grafting is described. The raw surface is always covered by a split graft.

The method is used in operations for scarring and flexion deformity, tendolysis, capsulotomy, etc. It is also useful to cover old, painful amputation stumps. BURNS PLEWES

Peripheral Blood Flow and Blood Volume Studies in the Dumping Syndrome.

D. B. HINSHAW *et al.*: *A.M.A. Arch. Surg.*, 74: 686, 1957.

A proportion of patients suffer from a symptom complex after gastrectomy called the dumping syndrome: gastric discomfort, nausea, palpitation, tachycardia, weakness, syncope, a feeling of warmth and sometimes explosive diarrhœa. A group of such patients were studied and the mechanism of the syndrome seemed to be rapid gastric emptying, intrajejunal hyperosmolarity, and a compensatory shift of extracellular fluid and plasma into the jejunal lumen to achieve isotonicity. Consequently, a reduction in circulatory plasma volume occurs. Plethysmograph studies showed that an increased peripheral blood flow is present in many patients with dumping symptoms. It is suggested that patients who exhibit severe dumping attacks have abnormal homœostatic vascular responses to sudden reductions in plasma volume. BURNS PLEWES

Value of Surgery in the Treatment of the Arteriosclerotic Leg.

J. C. LUKE: *Postgrad. Med.*, 22: 10, 1957.

Medical management of the arteriosclerotic leg is a slow procedure, and frequently of questionable value. Surgical treatment has now been used long enough to permit its evaluation, and it is of more value than medical treatment in cases in which the patients are selected properly. Lumbar sympathectomy is of limited value since it merely dilates the collateral vessels. However, it is useful in certain cases in which the use of arterial grafts is not possible.

The restoration of normal flow in the main vessel is the ideal of treatment, and it can be accomplished by the use of arterial grafts. The anastomosis may be end to end or end to side. The latter is preferable, especially if the main vessels are of medium or small size. This operation is particularly suitable in cases in which arteriography discloses segmental occlusion of a main vessel. The high percentage of cases in which arteriography will reveal such occlusion is surprising.

Although arterial homografts can be used to cure intermittent claudication, they also are indicated in selected cases of gangrene or impending gangrene of the foot. In the small number of cases in which the authors have used this procedure, limb salvage has been gratifying. Thrombo-endarterectomy can be used as an alternative method if segmental occlusion can be demonstrated. Its limitations are narrower than those of homografting, but the long-term results are better. S. J. SHANE

OBSTETRICS AND GYNÆCOLOGY

The Abnormal Vaginal Smear in Abortion.

J. R. PIERCE: *Am. J. Obst. & Gynec.*, 74: 119, 1957.

A study of the vaginal cytology in 583 women in early pregnancy is presented. Previous reports were confirmed that those with abnormal smears are more apt to abort. Those with abnormal smears were treated with progesterone or placebos (blind control). Progesterone, 25 mg. daily by the buccal route, is not effective in salvaging patients in this abnormal group.

Those with abnormal smears in early pregnancy are more apt to have placental abnormality. Progesterone in early pregnancy did not significantly decrease the incidence of these difficulties. The unsuccessful attempts of others to salvage pregnancies in this abnormal group are cited. Only by providing a good preconceptional environment can we improve the salvage rate in threatened abortion.

The stilbœstrol test of Piendel and van Meensel is a good prognostic test in cases of threatened abortion.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

The indiscriminate treatment of threatened abortion with hormones is condemned. ROSS MITCHELL

Treatment of Endometrial Tuberculosis with Streptomycin and PAS.

A. M. SUTHERLAND: *J. Obst. & Gynæc. Brit. Emp.*, 64: 423, 1957.

This is a supplementary report on an investigation carried out on behalf of the Research Committee of the British Tuberculosis Association and of the Royal College of Obstetricians and Gynæcologists. The investigation was started in July 1950 and ended in December 1952. One hundred and thirteen cases were studied; 63 were treated and the rest served as controls.

The results obtained in the treatment of endometrial tuberculosis by streptomycin and PAS for 12 weeks are much better than those observed in the controls as judged on the basis of a 12-month follow-up. The occurrence of toxic manifestations in four patients during treatment is disturbing, although in no case were there any permanent ill-effects.

Though a number of the control cases did apparently heal without treatment, the results obtained show that it is not now justifiable to withhold treatment from any patient with proved tuberculosis of the endometrium. A majority of cases in the "control" group remained positive on follow-up and a substantial number showed clinical deterioration in the course of the trial and required immediate treatment.

Further trials have been in progress since May 1953, in which streptomycin and PAS are being compared with streptomycin and isoniazid and with PAS and isoniazid, and different durations of treatment are being contrasted. While the present results are satisfactory in view of the short period of treatment, it is probable that longer periods comparable with those used currently in other forms of tuberculosis will prove even more effective.

ROSS MITCHELL

THERAPEUTICS

Treatment of Certain Forms of Tuberculosis with a Combination of Prednisone (or Hydrocortisone) and Antibiotics.

G. FAVEZ *et al.*: *Dis. Chest.*, 32: 70, 1957.

A description is given of 10 cases selected from a group of 120 patients suffering from active pulmonary tuberculosis. These 120 cases were treated with a combination of hydrocortisone (or prednisone), streptomycin and isoniazid. The results obtained in pneumonic tuberculosis, miliary tuberculosis and tuberculous meningitis were considerably better than those obtained by specific treatment alone.

It would seem, therefore, that acute pneumonic tuberculosis, miliary and serous affections and especially meningitis constitute an indication for prednisone treatment in addition to specific drugs. The results obtained are undoubtedly superior to those seen after antibiotic treatment alone. S. J. SHANE

Cycloserine Combined with Other Antituberculous Agents in the Treatment of Pulmonary Tuberculosis.

I. G. EPSTEIN *et al.*: *Am. Rev. Tuberc.*, 75: 533, 1957.

A group of 43 previously untreated patients with pulmonary tuberculosis was treated with cycloserine and isoniazid. An additional 14 patients were treated with cycloserine and streptomycin. The administration of cycloserine in full doses of 1.0 g. with 300 mg. of isoniazid per day, or 1.0 g. of streptomycin twice a week, was not associated with any additive toxic action. The administration of 1.0 g. of cycloserine with 300 mg. of isoniazid per day elicited prompt and marked antituberculous activity, as shown by clinical improvement, rate of weight gain, roentgenographic clearing, and reversal of infectiousness.

Reduction of the daily dose of cycloserine to 0.5 g. and of isoniazid to 4.0 mg. per kg. appears not to have altered the therapeutic efficacy of the combination. Clinical response and roentgenographic clearing were prompt and marked in most cases, with evidence of rapid reversal of infectiousness. Reduction of the daily dose of cycloserine lessened the incidence of side reactions. There has been only one questionable reaction among the 63 subjects so far treated with 0.25 g. of cycloserine used twice daily, either alone or in combination with isoniazid.

One gram of cycloserine per day combined with 1.0 g. of streptomycin twice a week gave results that were only slightly less prompt and smaller in degree than they were with the isoniazid-cycloserine combinations, but similar to those from the usual isoniazid-PAS regimen.

Clinical resistance to isoniazid-cycloserine therapy has not developed, as judged by progressive roentgenographic response. Sputum conversion was so rapid as to preclude testing for resistant bacilli in most acute cases after 24 weeks of therapy.

The use of smaller doses of cycloserine than heretofore employed, in combination with isoniazid, resulted in a non-toxic, highly effective regimen for the treatment of pulmonary tuberculosis. This combination proved superior to other therapy in speed and degree of clinical response. S. J. SHANE

Relationship of Therapy with Cortisone to the Incidence of Vascular Lesions in Rheumatoid Arthritis.

J. W. KEMPER *et al.*: *Ann. Int. Med.*, 46: 831, 1957.

In this study all instances of rheumatoid arthritis examined at necropsy at the Mayo Clinic through 1954 were reviewed, with special emphasis on the incidence and character of the vascular lesions and their relationship to the administration of cortisone. There were 52 patients in the study; 14 of these had received cortisone. Four (29%) of the group of 14 treated with cortisone had generalized lesions of polyarteritis nodosa, whereas none of the 38 patients who did not receive cortisone had such lesions.

These findings suggest that, in certain susceptible patients with rheumatoid arthritis, *the administration of cortisone may precipitate the development of diffuse necrotizing arteritis.*

Why this may occur in some patients with rheumatoid arthritis treated with cortisone and apparently not in patients with other diseases (with the possible exception of disseminated lupus erythematosus) is not clear.

No vascular lesions specific for rheumatoid arthritis were found in this study. S. J. SHANE

Steroid Therapy in Mumps Orchitis.

G. W. ZELUFF AND T. FATHEREE: *Ann. Int. Med.*, 46: 852, 1957.

Four cases of mumps orchitis were treated by steroid therapy. A rapid remission was noted in all cases, with a dramatic reduction in the local inflammation as well as generalized systemic effects.

Steroid therapy should be promptly instituted in all cases of mumps orchitis. Such measures will greatly reduce the severity of this painful, disabling entity and probably will reduce the degree of atrophy, potential sterility and possible hypogonadism. The prompt use of corticoids in mumps parotitis in adult males may even prevent the complication of an orchitis or pancreatitis.

S. J. SHANE

DERMATOLOGY

Athlete's Foot Fungi on Floors of Communal Bathing Places.

J. C. GENTLES: *Brit. M. J.*, 1: 746, 1957.

The author's summary reads as follows: "The same four shower stalls of a communal bathhouse were sampled before and after use on two separate occasions. It is clearly shown that the presence of dermatophytes as saprophytic colonies on the floor is extremely unlikely, and that the spread of infection almost certainly takes place by transfer of infected skin fragments. There is also evidence that skin fragments containing viable parasitic fungi are deposited and are on occasion present on the floors, if even for a comparatively short time, in very large numbers. It is pointed out that measures to control spread must be of a personal nature." The personal measures advocated are the use of sandals to prevent direct contact with the floors and the application of a fungicide after bathing.

ROBERT JACKSON

Psoriasis and Arthritis.

V. WRIGHT: *Brit. J. Dermat.*, 69: 1, 1957.

The author has investigated in detail 42 patients with psoriasis and arthritis, 55 with rheumatoid arthritis and 310 with psoriasis only. To distinguish rheumatoid from psoriatic (erosive) arthritis he used the Waaler-Rose differential agglutination test (D.A.T.). He found that 32 of 34 patients with erosive arthritis had a negative D.A.T. On this basis the author suggests that erosive arthritis and rheumatoid arthritis are separate entities.

ROBERT JACKSON

FORTHCOMING MEETINGS

CANADA

CANADIAN SOCIETY FOR THE STUDY OF FERTILITY, Annual Meeting, London, Ontario. (Dr. Morris P. Wearing, Secretary Treasurer, 289 Dufferin Ave., London, Ont.) November 8-9, 1957.

L'ASSOCIATION DE MÉDECINE INDUSTRIELLE DE LA PROVINCE DE QUÉBEC, Conjoint Annual Meeting with Section on Industrial Medicine of Ontario Medical Association, Montebello, Que. (Dr. A. H. Visser, Secretary, Suite 718 Sherbrooke Street West, Montreal 25, Que.) October 2-4, 1957.

CANADIAN MEDICAL ASSOCIATION, 91st Annual Meeting, Halifax, Nova Scotia. (Dr. A. D. Kelly, General Secretary, The Canadian Medical Association, 150 St. George Street, Toronto 5, Ont.) June 15-19, 1958.

UNITED STATES

THIRD INTERNATIONAL CONGRESS OF THE INTERNATIONAL SOCIETY OF ANGIOLOGY, Atlantic City, New Jersey. (Dr. Henry Haimovici, Secretary-General, 105 E. 90th St., New York 28, N.Y.) October 18-21, 1957.

FOURTH PAN AMERICAN PHARMACEUTICAL AND BIOCHEMICAL CONGRESS, Washington, D.C. (Dr. George B. Griffinhagen, Executive Secretary of the Congress, Smithsonian Institution, Washington 24, D.C.) November 3-9, 1957.

PAN AMERICAN ASSOCIATION OF OPHTHALMOLOGY, 5th Interim Congress, New York, N.Y. (Dr. William L. Benedict, 100 First Avenue Building, Rochester, Minnesota.) February 1, 1958.

INTERNATIONAL COLLEGE OF SURGEONS, 11th Biennial Congress, Los Angeles, California. (Dr. Karl A. Meyer, Secretary, 1516 Lake Shore Drive, Chicago 10, Illinois.) March 9-14, 1958.

INTERNATIONAL SOCIETY OF GASTROENTEROLOGY, 3rd World Congress, Washington, D.C. (Dr. H. M. Pollard, University Hospital, Ann Arbor, Michigan.) May 25-29, 1958.

OTHER COUNTRIES

WORLD MEDICAL ASSOCIATION, 11th General Assembly, Istanbul, Turkey. (World Medical Association, 10 Columbus Circle, New York 19, N.Y.) September 29-October 5, 1957.

FOURTH INTER-AMERICAN CONGRESS ON BRUCELLOSIS, Lima, Peru. (Dr. Alice C. Evans, 1661 Crescent Place, N.W., Washington 9, D.C.) October 6-8, 1957.

SYMPOSIUM ON THE PUBLIC HEALTH ASPECTS OF CHRONIC DISEASES, World Health Organization, Amsterdam, Netherlands. (WHO Regional Office for Europe, Palais des Nations, Geneva, Switzerland.) September 30-October 8, 1957.

FRENCH CONGRESS OF OTOLARYNGOLOGY, Paris, France. (Administrative Secretary, French Congress of Otolaryngology, 17, rue de Buci, Paris, France.) October 15-18, 1957.

ASSEMBLY OF ASSOCIATION OF FRENCH-SPEAKING DOCTORS, Paris, France. (General Secretary, Congrès Français de Médecine, Prof. G. Boudin, Paris, France.) October 16-18, 1957.

CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY, Mexico City, Mexico. (Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium.) October 27-November 2, 1957.

PAN AMERICAN CONGRESS OF ENDOCRINOLOGY, Buenos Aires, Argentina. (Secreteria General, Sociedad Argentina de Endocrinologia y Metabolisms, Santa Fe 1171, Buenos Aires, Argentina.) November 3-9, 1957.

INTERNATIONAL ACADEMY OF LEGAL MEDICINE AND SOCIAL MEDICINE, 5th International Congress, Madrid, Spain. (Professor B. Piga, Secretary General of Congress, Professor of Legal Medicine, Madrid University, Madrid, Spain.) April 16-19, 1958.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

PROVINCIAL NEWS

BRITISH COLUMBIA

The outstanding item of news from this province in July was the threat of strikes on the part of nurses staffing many of the hospitals in British Columbia, in order to enforce their demand for increases in pay. This is, we believe, the first time in the history of Canadian nursing that such a thing has ever happened and at first blush it is rather shocking—but there is a long history behind it.

In the first place, these nurses have been trying for a long time to obtain increases which would bring their pay up to the ordinary standard of pay for such a position as they occupy, as trained professional women. Their pay is often below that of an orderly or a competent office secretary. The hospitals, bound as they say by what B.C. H.I.S. will allow, are unable to grant the increases. This puts the baby right in the lap of the B.C. Government.

The nurses have been very patient and have exhausted every possible method of reaching their goal. Finally, conciliation boards have been adopted in each of the hospitals concerned. The nurses agreed to accept whatever the conciliation board decided. In every case so far, we believe, the boards have decided on an increase which the nurses have agreed to. And in many of the hospitals, from Penticton down through several others (this all started at Penticton), agreement has been reached.

It should be mentioned that, first, this action concerns only graduate nurses; second, it is endorsed entirely by the Registered Nurses' Association; and third, in every case the nurses have undertaken to leave skeleton and emergency staffs, and to do all this without pay.

We earnestly trust that the outstanding disputes will be settled in favour of our colleagues the nurses, whose case the great majority of us regard as just and fair.

At the recent session of the B.C. Legislature, it was decided by the Government to order an investigation by the University of British Columbia into the "Hoxsey cancer cure" and its merits.

This was done after a CCF member spoke in the Legislature in memory of Mr. Ernest Winch, M.L.A., who died recently. Mr. Winch, a very fine and earnest lover of his fellowmen, felt convinced that there might be something in the Hoxsey claims, and that the medical profession had not adequately examined these claims, though we understand that the U.S. Public Health and Food and Drug officials have branded the treatment as worthless.

At any rate, the Government decided to order this investigation, and a team has been sent by the University of British Columbia under the chairmanship of Dr. James M. Mather, Professor of Public Health. The team includes a specialist in tuberculosis and chest surgery, a lawyer, a representative of the Medical Services Association, and a layman. The Dean of Medicine at the University of British Columbia, Dr. John W. Patterson, will receive the report when it is completed after the team has visited Dallas, Texas, home of the Hoxsey clinic, and other centres. The report will be sent to Health Minister Eric Martin.

A new occupational disease has been recognized by the Workman's Compensation Board—tendinitis in the feet and legs in the case of bus drivers, whose constant foot movements lead to this. This is the first time this has been so recognized.

Victoria has been very keen on insuring the wide use of Salk polio vaccine. We recorded earlier the establishment of free clinics for adults. A special clinic has recently been set up for pre-school children who missed inoculation at the City Clinic. The new clinic will be held in the Health and Welfare Centre on Cook St.

Dr. Hertzmann, chairman of the educational committee of the B.C. Heart Foundation, recently gave us some figures with regard to heart disease in Vancouver. Recently the Community Chest of Vancouver has made the B.C. Heart Foundation one of its agencies, and provided $45,000 for its work last year. This year it hopes to increase this amount.

The Heart Foundation estimates that there are 3000 children in B.C. with congenital heart defects, and that about 400 more are born each year.

In line with this is the work being done by the B.C. Medical Research Institute, which has purchased a heart-lung machine, with a view to making heart operations more widely possible in British Columbia, where several surgeons specializing in heart and blood-vessel surgery are now doing research with this machine. It is hoped that before long it will be unnecessary to send these cases to other centres.

The purchase of the machine was made possible by the work of the Heart Club of Mount Pleasant Branch of the Canadian Legion, who raised the money to buy it.

September will be a busy month in medical circles. The Annual Meeting of the Canadian Medical Association, B.C. Division, will be held in Vancouver, September 24-27. During this time the College of Physicians and Surgeons will hold its Annual Meeting also, and will have as guest speaker Mr. Oliver Field, Director of the Bureau of Investigation of the American Medical Association. He will speak on "Some current aspects of medical quackery". During this week also the B.C. Division will hold many meetings, and will have an annual dinner and a full program of entertainment. The meetings of the Assembly will have first place, and there is a very complete program of lectures, clinics, etc., which will be of great interest.

Dr. Morley Young, President of the Canadian Medical Association, is expected and with him will be Dr. Clayton Crosby from Regina and Dr. J. A. L. Gilbert from Edmonton.

The guest speaker invited by the B.C. Division is Dr. Warren Nelson of New York.

J. H. MACDERMOT

SASKATCHEWAN

The James Picker Foundation recently announced two awards in the field of radiological research, in addition to those made public in June of this year. As a part of its efforts in advancing the science of radiology, the Foundation supports research grants, fellowships, and grants for scholars. These awards are made on recommendation of the National Academy of Sciences–National Research Council.

A research grant has been made to the University of Saskatchewan to permit continuation for a third year of studies on x-ray changes produced by increased pressure from within the skull. This will be under the direction of Dr. Sidney Traub.

It is planned to start a rheumatic fever prevention program in the Regina Rural Health Region in the immediate future. Its aims will be to bring the importance of early treatment to the attention of parents and family physicians, and, through regular penicillin treatment, to prevent the recurrence of the disease.

Overseeing the program will be a rheumatic fever committee composed of a pædiatrician, a specialist in internal medicine, a pathologist, and four general practitioners from Regina and the Health Region. This committee held its first meeting in August. Later it is assumed it will act as a consulting body to which rheumatic fever cases may be referred by general practitioners.

It is expected that free penicillin will be provided and home visits to all cases, although patients will remain under the care of the family physician. It is estimated that 80 persons in the Regina Rural Health Region have the disease in an active form.

Dr. J. D. Leishman of Regina is one of the Canadian members of the Executive Council of the Trail-Riders of the Canadian Rockies.

The Rockefeller Foundation of New York has granted an additional $75,000 for research work in psychiatry in Saskatchewan. The new grant is in continuation of the grant of $115,000 made in 1954 for the same project. The investigational research work is conducted in the mental hospitals at North Battleford and Weyburn, at Regina and in Saskatoon. At present the research staff totals about 30.

On August 14, the community of Maymont formally honoured Dr. John Arthur Scratch of that town by naming the day "Dr. Scratch Day". Dr. Scratch graduated in medicine from Toronto in 1905 and first registered in these parts in 1907, with the Northwest Territories Medical Board. His name is a byword in Maymont and a sixty-mile radius, whose people he has served unselfishly for the past fifty years. About 1000 people were present at the ceremony, when an engraved wrist watch was presented to him. Funds were also collected throughout the district to establish a scholarship in his name.

Dr. Scratch, in thanking the people for the honour given him, reviewed many of his past difficulties, experiences and rewards while serving the early pioneers of this part of Saskatchewan. Twenty-five years ago he had been similarly honoured by a "Dr. Scratch Day" held as a token of appreciation.

G. W. PEACOCK

ONTARIO

Dr. C. R. Robinson, formerly lecturer in bacteriology at the London Hospital Medical College, University of London, England, has been appointed FitzGerald Memorial Fellow in the School of Hygiene, University of Toronto. Dr. Robinson graduated from the University of Cambridge with the degree of M.B., B.Chir. Dr. Robinson has had experience in bacteriology and virology in Malaya and in his new appointment he will work as a member of a research team studying virus infections under the direction of Dr. A. J. Rhodes.

The American Foundation for Allergic Diseases has for the first time awarded two of its scholarships to Canadians, one in Ontario and one in Quebec. Mr. H. W. Edgar, who is in his fourth year at the University of Western Ontario School of Medicine, London, Ontario, has been awarded a $500 scholarship for research and clinical training in the field of allergic diseases, and will carry out an investigation on the effect of chlorpromazine and allied drugs on the peripheral circulation in animals and humans, under the direction of Dr. John H. Toogood, instructor in medicine and director of the Allergy Clinic and Laboratory in Victoria Hospital, London, Ontario.

NOVA SCOTIA

Dr. R. L. Aiken of Halifax, a specialist in internal medicine and diseases of the chest, was elected a Fellow of the American College of Chest Physicians at the annual convention in New York, July 17, 1957.

Dr. T. B. Acker, a Halifax orthopædic surgeon, has been elected vice-president of the 1958 meeting of the combined British, American and Canadian Orthopædic Associations, to meet next year in Washington, D.C. Dr. Acker was attending the Canadian Orthopædic Association meeting at Murray Bay, P.Q., at the time of his election.

Dr. Kenneth A. MacKenzie, retired specialist in internal medicine of Halifax, was a guest of honour at a testimonial dinner held on June 22 in the Nova Scotian Hotel. The dinner was held by the Royal Sussex Masonic Lodge, and was in honour of his fifty years' membership in the Masonic Order. Following the dinner, Dr. MacKenzie was presented with a fifty-year jewel of the Order, and a toast was proposed by Dr. A. E. Doull.

WALTER K. HOUSE

Canad. M. A. J.
Sept. 15, 1957, vol. 77

NEW BRUNSWICK

The Restigouche Medical Society was host to the 77th Annual Meeting of the New Brunswick Medical Society, held in the Algonquin Hotel at St. Andrews on August 25 to 27. Representatives from the Canadian Medical Association were Dr. Morley A. R. Young, President; Dr. A. D. Kelly, General Secretary; and Mr. L. W. Holmes, Assistant Secretary.

The scientific program included two papers: "The present status of surgery in breast cancer" and "Present status of surgery in the treatment of thyroid disease", by Dr. Harold L. Richard, Assistant Professor of Surgery, University of Alberta. Dr. K. J. R. Wightman, Professor of Therapeutics, University of Toronto, discussed "Problems in the use of antibiotics, 1957" and took part in a panel discussion on "Psychosomatic problems in medical practice". The moderator of this panel was Dr. J. H. Mackinnon and members were Dr. R. H. Macdonald, Dr. Paul Melanson and Dr. D. A. Thompson. "The non-surgical dictates of anæsthetic practice" was the subject discussed by Dr. David Power, Anæsthetist at St. Mary's Hospital, Montreal. Dr. Hector J. A. Beaudet, Assistant Professor of Surgery, Laval University, summarized "Surgery of gastric and duodenal ulcer".

The business sessions of our annual meetings take an increasing amount of time, and subjects of urgent importance seem to multiply each year. Dr. J. M. Rice of Campbellton, President of the Society, was chairman at business sessions, assisted by Dr. Fred Jennings, Vice-president.

Subjects of major interest were the reports of the executive committee, the report of the registrar of the Medical Council of New Brunswick, presented by Dr. J. M. Barry, and the reports of standing and special committees.

Dr. G. M. White reported concisely on activities of the C.M.A. executive committee, this report being supplemented by remarks by Dr. A. D. Kelly. Dr. Arthur VanWart read his 25th report of the economics committee and resigned the position as chairman, because of his new duties as President-elect of the C.M.A. Prepaid medical and hospital care, service plans, hospital insurance increases and problems common across Canada received much attention. The provincial registration of medical specialists is proceeding. The N.B. Medical Society is to continue its support of the Dalhousie Post-Graduate Program.

The cancer control program was the subject of long discussion, and the amount of general interest in this division of the N.B. Department of Health is encouraging. The revision of the N.B. Medical Act was completed by a special committee of the council, and will be presented at the next session of the N.B. Legislature. Dr. H. S. Wright of Fredericton was chairman of this committee. Workmen's Compensation Board problems were reported to be satisfactorily resolved, but further discussions with the board are anticipated on fee structure.

A new group disability insurance program for members of the society is now in effect, and all members are interested in the Federal Government Retirement Savings Plan.

The following honours to members were announced: Senior membership in C.M.A., Dr. G. B. Peat, Saint John; Life Membership in N.B. Medical Society, Dr. Francis E. Boudreau, Moncton; Honorary Membership in N.B. Medical Society, Dr. Gavin Miller, St. Andrews.

Wing Commander D. O. Coons was the guest speaker at the meeting of the Defence Medical Association. His topic was "Fractures in aviation medicine". This association elected the following officers: President, Dr. A. Chaisson; First Vice-president, Dr. Fred George; Second Vice-president, Dr. John McLaughlin; Secretary, Dr. Robert Brown.

The N.B. Chapter of the College of General Practice met during the annual meeting of the Provincial Society and elected this slate of officers: President, Dr. Stephen Clark, Saint John; Vice-president, Dr. F. E. Legere, Moncton; Secretary, Dr. Percy Losier, Chatham; Treasurer, Dr. E. C. Reid, Plaster Rock.

Officers of the N.B. Medical Society for the 1957-58 period were elected as follows: President, Dr. F. C. Jennings, Saint John; 1st Vice-president, Dr. R. B. MacKenzie, Newcastle; 2nd Vice-president, Dr. Paul Melanson, Moncton; Treasurer, Dr. Norman Skinner, Saint John. The Secretary, Dr. Fred Whitehead, was reappointed.

Representatives of District Societies to Executive: Restigouche, Dr. C. Doucette; St. Croix, Dr. E. Stiles; York-Sunbury, Dr. B. Jewett; Carleton-Victoria, Dr. J. A. Wilson; Saint John, Dr. F. George; Gloucester, Dr. W. B. Orser; Kings, Dr. T. S. Douggan; Miramichi, Dr. F. G. Wilson.

Delegates to General Council of the C.M.A.: Dr. F. C. Jennings, Dr. J. H. M. Rice, Dr. F. L. Whitehead, Dr. R. B. MacKenzie, Dr. Paul Melanson, Dr. W. Ross Wright, Dr. D. A. Thompson, Dr. G. M. White and Dr. Darius Albert. Dr. Jennings will represent New Brunswick on the C.M.A. nominating committee and Dr. G. M. White will be the New Brunswick member on the executive committee of the C.M.A.

Dr. Thomas Foster of Saint John won the VanWart Trophy in the golf competition at the annual meeting of the Medical Society.

A. STANLEY KIRKLAND

CHANGE OF ADDRESS

Subscribers should notify the Canadian Medical Association of their change of address *two* months before the date on which it becomes effective, in order that they may receive the Journal without interruption. The coupon on page 79 is for your convenience.

BOOK REVIEWS

ANNUAL REVIEW OF MEDICINE. Vol. 8, 1957. Edited by David A. Rytand, Stanford University School of Medicine. 530 pp. Annual Reviews, Inc., Palo Alto, California, 1957. $7.50.

The eighth volume of the *Annual Review of Medicine* contains the usual series of good review essays with extensive bibliographies. The book opens with a discussion of infection and the adrenocortical hormones, in which the hazard of infection during their use is discussed, data on their use in combination with antimicrobial agents in infections are summarized, and their possible protective role in infection is mentioned. There is an essay on the prophylaxis of infection by biological and chemical means, in which a long section deals with poliomyelitis; the section on BCG records the misgivings with which this vaccine is viewed by some U.S. workers and the change of opinion by Wallgren who has now decided that mass vaccination is unnecessary in countries like Sweden, where primary infection is late. Prevention of rheumatic fever with chemicals such as sulfadiazine or penicillin is discussed, but it is noted that continual prophylaxis is not recommended for acute glomerular nephritis. The limitation of use of antibiotics in elective surgery is also suggested.

An essay on diseases of the gastro-intestinal tract devotes a great deal of space to certain aspects of liver pathology, noting the discouraging results of the treatment of hepatic coma. The cardiovascular section is now divided into two sections on the medical and on the surgical aspects respectively, with a great deal more space devoted to the surgical features. An unusual feature is a contribution on the red cell and some related problems. There are long essays on endocrinology, allergy, and immunology, and a short note on medical obstetrics, including a section on population control and one on fetal salvage. The essay on diseases of the nervous system contains an important section on metabolic disorders of the nervous system; that on psychiatry dismisses the tranquillizing drugs with a cautious statement of a few lines. An English contributor has produced a review of pneumoconiosis, silicosis, and the physics and chemistry of dust. Other unusual contributions include one on actions of heparin other than those on coagulation, and one on experimental retrolental fibroplasia. The volume is as informative and useful as ever.

PROGRESS IN NUCLEAR ENERGY, Series VII, Medical Sciences, Vol. I. Edited by J. C. Bugher, New York, J. Coursaget, Saclay, France, and J. F. Loutit, Harwell, England. 165 pp. Illust. Pergamon Press Limited, McGraw-Hill Company of Canada Limited, Toronto, 1956. $7.20.

This book is, as the title of the series implies, a progress report of the role of nuclear energy in medicine, with each of the chapters written or compiled by an internationally recognized authority on the subject concerned.

The first chapter, entitled "Radioactive isotopes in medical diagnosis", is a good introduction to their practical clinical applications. It contains a critical review of each field and is followed by numerous references. The short second chapter, "The diagnosis and investigation of disease with radioactive isotopes", provides just a glimpse of the wide variety of biochemically orientated studies the world over. Further chapters describe very briefly the present status of artificially produced radioactive isotopes for both internal and external application. There is a short history and discussion of the problem of "radiation safety", and an interesting although uncoordinated review of administrative and legal viewpoints in Japan, the United Kingdom, the U.S.A., and the U.S.S.R. This section includes reports on behalf of the World Health Organization and the International Labour Office. The contribution of the late A. J. Cipriani sums up the more important considerations for safety in industry; and in the final chapter Failla discusses dosimetry of ionizing radiation at a level suitable for the specialist.

Because of its small size and the varying aims of the writers, this volume will not serve as a general reference. However, the excellent introduction and at least four of the seven chapters will provide interesting and authoritative reading for physicians seeking an introduction to the subject.

REHABILITATION IN ENGLAND. Federal Ministry of Labour, Bonn, W. Germany. 287 pp. Illust. Georg Thieme Verlag, Stuttgart; Intercontinental Medical Book Corporation, New York, 1957. $8.60.

It might seem at first glance that the monograph on *Rehabilitation in England*, written by German observers for use within Germany, would have little application elsewhere. It is however of considerable interest to see how the efforts made to rehabilitate all types of diseased and injured in the United Kingdom strike a foreign observer; this monograph records many favourable impressions in considerable detail. The German observers were impressed with the fact that rehabilitation is carried on in general hospitals as well as in specialized units, the latter having some additional functions such as research and experimental studies. They note the importance attached to an early beginning of rehabilitation. Rehabilitation begins when the patient's treatment begins, and is not left until the convalescent stage. They also note the importance attached to preservation of mental health during rehabilitation. Special attention is given to the rehabilitation of patients with injuries and diseases of the central nervous system, and there is a separate report on the Institute for Spinal Injuries at Stoke Mandeville. The last chapter of the book is a separate account of a European seminar on the rehabilitation of the blind. The volume constitutes one of a series entitled "Work and Health" published by the West German Federal Ministry of Labour.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

DICTIONARY OF MICROBIOLOGY. M. B. Jacobs, Department of Air Pollution Control, New York City, M. J. Gerstein, William H. Maxwell Vocational High School, Brooklyn, N.Y., and W. G. Walter, Montana State College, Bozeman. 276 pp. Illust. D. Van Nostrand Company (Canada) Limited, Toronto, 1957. $7.25.

The type used in this edition is the same as that for the usual dictionary. Definitions are kept short and simplified, a fact which will certainly limit its usefulness to only those whose work brings them in contact with the fringes of microbiology and the related sciences. Covered in some detail are the important culture media, stains and staining procedures, and diagnostic tests used in bacteriology—and yet a commonly used medium such as MacConkey's agar has been omitted.

As stated by the authors, "This dictionary defines the terms commonly used in microbiology and the related fields of bacteriology, mycology, virology, cytology, immunology and immunochemistry, serology, and microscopy". That this can be done in only 276 pages of well-spaced large print is quite remarkable.

LABORATORY MANUAL OF MICROBIOLOGY. H. Magdalene Steward, School of Nursing, Presbyterian-St. Luke Hospital, Chicago, Ill. 103 pp. Illust. 2nd ed. The C. V. Mosby Co., St. Louis, Mo., 1957. $2.25.

One often wonders just how much practical laboratory teaching a nurse in training should receive. This is answered very nicely by Miss Steward in her *Laboratory Manual of Microbiology* (for nurses).

The manual is a soft-covered book with the pages scored and perforated on the inside edge so that they can be removed and inserted into a loose-leaf note book presumably as the exercises are completed. The course is divided into 19 separate laboratory periods. It includes, as well as discussion of the usual morphologic groups of organisms, well-planned exercises for study of methods of inhibiting and destroying micro-organisms, methods of transmission of disease organisms, and microbiology of food, water, and milk. Spaces for drawings, recording of results, and questions and answers at the end of each section make this a most useful manual. It could be made readily adaptable for use in most nurses' courses of microbiology.

PRINCIPLES OF MICROBIOLOGY. Charles F. Carter and Alice Lorraine Smith, Dallas, Texas. 3rd ed. 665 pp. Illust. The C. V. Mosby Company, St. Louis, Mo., 1957. $5.00.

This is an excellent textbook of bacteriology for the student and graduate nurse. As the authors themselves state, the purpose of their book is not to add to existing knowledge of microbes but to present a brief general survey of the principles of microbiology. This is done in a clear and well-organized manner, beginning with a collective history of the subject in which the contributions of some 70 scientists are briefly reviewed.

As well as covering the usual list of cocci, bacilli, and spirochaetes, the book has sections on viruses, rickettsiae, fungi, and on parasitology, which, although short, are adequate for the student nurse.

The book is nicely designed for the nursing instructor in microbiology in that one chapter is devoted to the material that should be presented in the laboratory classes and how it should be prepared. The lists of questions at the end of each chapter are a boon to the instructor as well as the student. This book would be a valuable addition to the library of any nursing school.

PHARMACOLOGICAL AND CHEMICAL SYNONYMS. E. E. J. Marler. 85 pp. Excerpta Medica, Amsterdam, 1956. $3.50.

This is a helpful addition to the reference works designed to assist the reader to find his way through the fog of pharmacological and chemical synonyms for new drugs. The author has collected more than five thousand references from the world's medical literature and has produced a book in two parts. The first part contains a list in alphabetical order of synonyms, proprietary, non-proprietary, and chemical. The second part contains a selection of the approved names for drugs in alphabetical order, with references to the synonyms. As might be expected, such a list proves on examination not to be exhaustive, but gaps are not serious or many. There is a small addendum of more recent drugs, but it is surprising to find that neither meprobamate nor its two common trade names figure in this. On a spot check, a few other North American names of products commonly advertised are missing, but no doubt this work will be kept continuously up to date. It most certainly deserves a place on the shelf with the other reference works in medical libraries, hospitals, research institutes, and places where the workers have to deal with drugs.

MODERNE CHEMISCHE METHODEN IN DER KLINIK (Modern Chemical Methods in Clinical Practice). Edited by Manfred Büchner. 268 pp. Illust. Veb Georg Thieme, Leipzig, W. Germany, 1956. DM 32.70.

This is a book designed to be of use to personnel working in chemical-pathological laboratories, and is almost exclusively concerned with the application of physico-chemical methods to medical science. The first section considers electrochemical methods in medicine, including measurement of potential and pH; the next section concerns polarography, followed by electrophoresis and paper chromatography. Flame photometry and complexometry are then discussed and there are closing sections on the determination of clinically important steroids, chemical determination of adrenocortical hormones, and the controversial fibrin degradation reaction of Nitsche. In each section, the basis for the work is discussed together with full details of techniques, material, and evaluation of results.

THE METABOLIC RESPONSE TO NEONATAL SURGERY. Peter Paul Rickham, Royal Liverpool Children's Hospital. 93 pp. Illust. Harvard University Press, Cambridge, Mass.; S. J. Reginald Saunders and Company Limited, Toronto, 1957. $5.50.

The objective of this book is to emphasize the importance of good preoperative and postoperative supportive management in the surgery of premature and newborn infants. Based on the author's careful studies of 10 patients, the procedure ranged from simple excision of tumour to extensive intestinal resection. In contrast with some authors. Rickham feels that very young babies withstand surgery better than older infants and adults. One of the major postoperative problems is the predilection to vomiting and aspiration most commonly encountered after bowel surgery. The necessity for intravenous fluid therapy during this period requires understanding of the physiology of the newborn by the responsible surgeon. Definite limitations upon the water and salt tolerance because of immaturity of the kidneys require exact balances to be recorded under the supervision of trained nursing personnel.

The case analyses, with clear graphing of data in each instance, made possible the recognition of the stages through which each patient progressed towards recovery. Based upon physiological adjustments, the body handling of sodium, chloride, potassium, urea, nitrogen, and calories and fluid work were compared to changes in weight, appetite, activity, and general responsiveness. In order to assess these clinical stages adequately in the light of associated biochemical events, Rickham advises that no operation upon the very young be contemplated unless laboratory facilities are available to measure serum urea nitrogen, CO_2 combining power, proteins, and chloride.

This book is well written, provides much worthwhile experience, and fills a very definite need. It will be well received by any physician concerned with the operative management of premature or newborn babies but especially by those surgeons whose experience may have placed more emphasis upon technique and less upon the metabolic behaviour of this special age group.

LEHRBUCH DER INNEREN MEDIZIN (Textbook of Internal Medicine). Vol. I. Edited by Helmut Dennig, Stuttgart. 920 pp. Illust. 4th ed. Georg Thieme Verlag, Stuttgart, W. Germany; Intercontinental Medical Book Corp., New York, 1957. $12.50.

LEHRBUCH DER INNEREN MEDIZIN (Textbook of Internal Medicine). Vol. II. Edited by Helmut Dennig, Stuttgart. 892 pp. Illust. 4th ed. Georg Thieme Verlag, Stuttgart, W. Germany; Intercontinental Medical Book Corp., New York, 1957. $12.50.

This new edition of a standard well-known text on internal medicine appears after an interval of three years. Previous editions have proved very popular and the opportunity has been taken to make extensive revisions of the text for this fourth one. Most of the articles within these two volumes are written with a considerable economy of words, as illustrated by the two sentences in which the patient with oligophrenia phenylpyruvica is described, "Oligophrenics are usually light blond and pale. They perspire profusely, and have a peculiar odour; they stand on a broad base with knock-knees and waddle on walking." The clinical descriptions are in general as precise and to the point as the one cited. The usual differences in therapeutic outlook between North America and Germany are evident in this book. For example, in the section on infectious diseases, Dennig points out that whereas the doctrine of elimination of focal infection has lost much ground in North America, it is gaining in Germany. He advises quite definitely prophylactic removal of septic foci, and also their therapeutic removal in conditions otherwise difficult to influence. There is more emphasis on diet and spa therapy than would be found in an American book. On the other hand, modern therapeutic methods are described much as they would be here. The section on the new oral antidiabetic drugs, for example, is restrained and cautionary in its tone, and the uses and abuses of antibiotics and sulfonamides are set out in full. The book is well illustrated, but the bibliography contains mainly references to textbooks, mostly of German origin with a few key North American books. Standard of production is good and the book is a good example of a typical textbook of medicine from the German-speaking world.

ROLE OF HOSPITALS IN PROGRAMMES OF COMMUNITY HEALTH PROTECTION: First Report of the Expert Committee on Organization of Medical Care. WHO Technical Report Series No. 122. 34 pp. World Health Organization, Palais des Nations, Geneva, 1957. $0.30.

The first report by the World Health Organization on the organization of medical care and its relationship to the hospital and the community will serve not only as a useful but a very general practical guide to the further development of health services. This report might well be studied by those responsible for the development of the projected health insurance in Canada.

The extension of the day hospital and night hostel from the realms of psychiatry to other medical fields, although a revolutionary step, might well help to reduce the large waiting lists prevalent in hospitals today and at the same time secure earlier admission and consequently earlier diagnosis.

The report outlines the importance of home care programs, so successful in the United States but as yet undeveloped in Canada, and it emphasizes the importance of control of these home care programs by physician-nurse team rather than the overrated medical social worker. The importance of rehabilitation is also stressed in this report, especially its closer integration with the acute general hospital.

Canada has come a long way in the last decade in developing an outstanding health and hospital program, but this report emphasizes certain aspects which merit study and implementation.

Canad. M. A. J.
Sept. 15, 1957, vol. 77

SCOVILL'S THE ART OF COMPOUNDING. Edited by Glenn L. Jenkins, Purdue University School of Pharmacy, Lafayette, Indiana; Don E. Francke, University Hospital, University of Michigan; Edward A. Brecht, University of North Carolina School of Pharmacy; and Glen J. Sperandio, Purdue University School of Pharmacy. 551 pp. Illust. 9th ed. McGraw-Hill Company of Canada Limited, Toronto, 1957. $11.55.

This excellent volume maintains its standing as one of the best books available in the field of compounding and dispensing. The revision has been comprehensive. There has been a lengthening of the chapters on ointments and suspensions and there is a new chapter on ophthalmic solutions as well as a new table of metric and apothecary equivalents. Although this book is essentially American in its approach, most of the basic information contained herein is such that it may be applied readily to our Canadian requirements.

The entire field of compounding and dispensing is covered in meticulous detail by the authors, and while much of the classic dispensing has been retained there has been much added in the newer trends. This edition contains up-to-date listings of prescription specialties and trade-named products which are official in the latest revisions of the U.S.P. and N.F. The chapters dealing with incompatibilities are written in a logical, concise manner with a clarity that makes this section a "must" for the physician, so that he may avoid, in his prescription work, many undesirable combinations and therapeutic incompatibilities.

This text will be a valuable addition to both the physician's and pharmacist's reference library.

PRINCIPLES OF RENAL PHYSIOLOGY. Homer W. Smith, Professor of Physiology, New York University College of Medicine. 237 pp. Illust. Oxford University Press, New York, 1956. $5.25.

Traditionally the art of medicine is associated with the ability to assess renal function by the earnest scrutiny of a glass of urine, but the development of renal physiology has advanced clinical evaluation of kidney function into a mathematical science subject to statistical analysis. Nowhere else in medicine does Lord Kelvin's dictum of numerical valuation apply more than in renal physiology, and yet we seldom consider our kidneys while they function normally. In this book the author, foremost among leaders in the study of the subject for 30 years, has sought to simplify the complexities of renal physiology so that the student and clinician can comprehend the functioning of the normal human kidney.

The earlier chapters are concerned with the anatomy of the kidney, the history of renal physiology, and the measurement of glomerular filtration and tubular absorption and excretion. It is indeed fortunate that blood and urine chemistry and micro methods of analysis of nephron urine enable us to study the passage of dissolved substances from blood to urine. Kidney activity is expressed in terms of figures; the author then discusses the fascinating subject of renal physiological function in maintaining the integrity of the extracellular compartment of the body. The final chapter is concerned with renal circulation which, as the author remarks, is the key to the morphology and the physiological function of the kidney.

Among the six appendices is a valuable one on electron microscopy of the nephron, and another on the methods of measurement; answers to problems set at the end of each chapter are given in the final appendix. The index, and the bibliography for each chapter, further enhance the value of this scholarly exposition of renal physiology. All of us endeavouring to understand renal physiology and function, and the maintenance of the integrity of body fluids, should read and refer to this book frequently, and will agree that the art of the clinician is now reflected in his knowledge of the science of renal physiology.

ENCYCLOPEDIC GUIDE TO NURSING. Helen F. Hansen, University of California School of Nursing. 406 pp. Illust. McGraw-Hill Company of Canada Limited, Toronto, 1957. $6.00.

This book is virtually a concise dictionary of medical sciences for nurses. Entries appear in alphabetical order, and in addition to the definition of each word some further information on it is given as in a desk encyclopaedia. Thus, for example, under the entry "Acne", the definition of acne is given, followed by its types, and a description is then given of the etiology, clinical features, and basic principles of treatment. Appendices contain a list of commonly used abbreviations, prefixes, suffixes, and combining forms, a table of chemical elements, temperature equivalents, and equivalents of weights and measures. This book should be useful to nurses for rapid reference, particularly in the early stages of their training.

LEHRBUCH DER TROPENKRANKHEITEN (Textbook of Tropical Diseases). Edited by E. G. Nauck, Hamburg. 432 pp. Illust. Georg Thieme Company, Stuttgart, W. Germany; Intercontinental Medical Book Corporation, New York, 1956. $15.25.

One of the minor by-products of World War II is the fact that there has been no textbook of tropical medicine in the German language since 1942. This book by Professor Nauck, who teaches tropical medicine in the University of Hamburg, is designed to fill this unfortunate gap. Since conditions are now favourable once again to the advent of German medical men in tropical areas, this book will no doubt be greeted warmly.

It is a textbook of medium size, well illustrated but without a bibliography. Physical descriptions are adequate, and therapy of the more important conditions such as malaria is discussed in considerable detail; laboratory diagnostic techniques are in general not described, and in the less common conditions therapy is mentioned in general terms without details of dosage. In the main this textbook should worthily maintain the tradition of German tropical medicine.

(Continued on page 645)

(Continued from page 642)

STUDY GROUP ON ATHEROSCLEROSIS AND ISCHAEMIC HEART DISEASE. World Health Organization Technical Report Series No. 117. 40 pp. World Health Organization, Palais des Nations, Geneva, 1957. $0.30.

Nineteen experts from eight countries met in Geneva November 7-11, 1955, to discuss atherosclerotic heart disease in the fields of clinical medicine, pathology, nutrition, public health, research, statistics and insurance.

Definition of terms and the need for standard diagnostic criteria were primary items on the agenda. Heredity, constitution and sex, evaluation of environmental factors in population, and statistical studies were discussed, with the problems of stress, strain, and mental tension; tobacco and alcohol; and physical activity. Aspects of atherosclerotic diseases covered included hypertension, diet in ischæmic heart disease and thrombosis, and metabolic disorders. Epidemiological studies and their application to public health services were considered, with possible contributions of international agencies; and the need for further research was stressed.

In addition to the report and recommendations arising out of the consideration of these topics, two annexes are included in the book. One is a paper on the evaluation of environmental factors in population and statistical studies. The second is concerned with the present status of public health facilities and organization in the field of cardiovascular disease.

The study groups report the need for more information concerning the relative and absolute importance of the various aforementioned factors. A plea is made for improvement, on an international basis, in the collection and standardization of all pertinent clinical and pathological data.

This report should be of particular interest to those engaged in public health work.

THE INVESTIGATION OF DEATH. Donald Karl Merkeley, Washington State College, Pullman, Wash. 138 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1957. $5.00.

The publisher's note on the jacket states that this book is written especially for the police officer and non-medical investigator. It will also be of some interest to the doctor who may occasionally be asked to assist in some phase of a medico-legal case.

The subject is outlined with emphasis on the common procedures and possible pitfalls involved in a medico-legal investigation. It stresses the need for thorough autopsies performed by competent pathologists in cases selected for examination, and indicates the general nature and value of the data thus derived. The more frequent forms of violent death and injury are classified and described and illustrated briefly. There are also short discussions on toxicology, blood typing, and the handling of evidence.

The factual information available in this monograph is not great, but the material it contains is clearly presented. It will undoubtedly serve as a useful introduction and guide for non-medical personnel assisting in medico-legal investigation.

DIE PROGNOSE DER WIRBELSAULENLEIDEN (The Prognosis in Vertebral Disease). J. E. W. Brocher, Genf. 67 pp. Illust. Georg Thieme Verlag, Stuttgart, W. Germany; Intercontinental Medical Book Corporation, New York, 1957. $3.05.

The thesis of this long essay is the importance of routine examination of the vertebral column in physical workers; it requires careful examination to decide what types of work a person with a vertebral anomaly can undertake. The author considers the methods of examination of the vertebral column and then discusses the findings in various conditions such as adolescent kyphosis, degenerative disorders of the vertebræ, malformations, and infectious and neoplastic disorders. He then considers the methods of assessing the risk of clinical disability in any of these conditions, illustrating his theme with adolescent kyphosis, which he assesses according to such characteristics as the extent of vertebral changes, presence of clinical manifestations, behaviour of the vertebral column, behaviour of the musculature, and progress in other members of the family. According to the risk of breakdown of compensation, the patient can be given work of various degrees of severity. The author feels that routine prophylactic examination of the back in pre-employment examinations should be as much of a routine as examination of the lungs.

to awaken any baby's natural liking for meat

SWIFT ANNOUNCES 3 NEW fruit-flavored MEATS for BABIES!

100% Strained Pork *with* Apple Sauce Added

100% Strained Ham *with* Raisin Sauce Added

100% Strained Lamb *with* Mint Flavour Added

High in Protein...Highly digestible!

As a doctor, you know that some babies take to meats from the start. Other babies take a little longer to become acquainted with meat's distinctive flavor.

To some mothers, you may have suggested combining meat and fruit to implement baby's earlier acceptance of meat.

Because this is so sensible and works so well, Swift scientists have created three new and wonderful-tasting fruit-flavored meats.

All three are 100% meat, with a bit of fruit or mint added for tempting flavor. They're smooth, too. So smooth babies take to them easily, quickly. They're high in protein and very easy to digest.

And they're as delicious, as wholesome, as Swift's 102 years' experience in preparing fine meats can make them. You can recommend all three with complete confidence. (Available in chopped style for Juniors, too.)

12 other tasty varieties

Beef, Pork, Ham, Liver & Bacon, Lamb, Liver, Chicken, Chicken & Veal, Veal, Beef Heart, Egg Yolks, Salmon Seafood for Babies.

Swift
102 ND YEAR

To Serve You Better

Meats for Babies — Swift's most precious product

MEDICAL NEWS *in brief*

(Continued from page 609)

BIBLIOGRAPHY OF MEDICAL REVIEWS

Thirteen months after the publication by the U.S. Dept. of Health, Education and Welfare of the experimental *Bibliography of Medical Reviews, 1955*, Volume 2 made its appearance in August. In the interim, ample evidence of its acceptance was accumulated to warrant the continuation and expansion of the venture as a regular annual publication of the National Library of Medicine.

The 1500 copies of Volume 1 were quickly distributed within the first few months and requests have continued to be received. This time almost twice the number of copies were printed and sufficient supplies should be available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C., at 60 cents a copy.

The internal format and arrangement of the second volume remain about the same as before. Complete entries, including the bibliographic reference and translation of foreign title, appear under the various subject headings derived from the *Current List of Medical Literature Subject Heading Authority List;* cross references are not restricted to those in the *Authority List* but are provided generously. The over-all size of the issue is substantially greater, with about 1800 review articles cited as compared with 1100 articles in Volume 1. In both volumes, all material was culled exclusively from journals indexed in the *Current List of Medical Literature.* The collection basis for *Bibliography of Medical Reviews III* has been broadened to include review articles published in journals which are not already indexed in the *Current List of Medical Literature.* Consequently, the next volume will show a further increase in size as well as other format changes including the provision of an author approach to the material.

BRITISH MEDICAL ASSOCIATION PRIZES

The British Medical Association offers certain prizes during 1958, one of which may be of particular interest to members of the Canadian Medical Association. This is the Middlemore Prize for 1958 which consists of a cheque for £50 and a certificate to be awarded for the best essay on "Local Antibiotic Treatment in External Ocular Disease". Notice of intention to enter for the competition should be made on the appropriate entry form, copies of which can be obtained from the Secretary, British Medical Association, B. M. A. House, Tavistock Square, London, W.C.1. Essays must reach the Secretary on or before January 31, 1958.

Two prizes are also offered by the Association for the promotion of systematic observation, research and record in general practice. These are the Sir Charles Hastings

Clinical Prize (£75) and (as second prize) the Charles Oliver Hawthorne Clinical Prize (£50). In this case, however, entrants must be members of the British Medical Association and engaged in general practice. Work submitted must include personal observations and experiences collected by the candidate in general practice. Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London W.C.1, not later than December 31, 1957. Preliminary notice of this competition is required on a form of application to be obtained from the Secretary at the above address.

BRITISH EMPIRE CANCER CAMPAIGN EXCHANGE FELLOWSHIPS

The British Empire Cancer Campaign has established two Fellowships per annum for Canadians.

These Fellowships are tenable for 12 months and of an approximate value of £1,500 per annum. Travelling expenses of the Fellows from their Canadian residence to England and return will be borne by the National Cancer Institute of Canada. If necessary, an allowance will also be paid for expenses in connection with the work undertaken. The Fellowships are open to those engaged in the clinical and allied sciences and to those working in fundamental research.

Application forms may be obtained from: The National Cancer Institute of Canada, 800 Bay Street, Toronto, Ontario.

Applications should be submitted to the above address not later than November 1, 1957. Awards will be announced December 15, 1957. Fellowships will become tenable July 1, 1958.

SURGICAL TREATMENT OF LUMBAR DISC HERNIATION

Two Norwegian surgeons, Berg and Kolstad (*Tidsskr. norske laegefor.*, 77: 513, 1957), record their results in a series of 135 patients with lumbar disc herniation, of which 100 were treated by surgery. The usual range of symptoms was present, and myelography with a water-soluble contrast medium was used as a routine without complications. The radiological diagnosis proved correct in about 90% of patients operated on. In 56 cases the operation consisted of simple disc removal; in 44 cases spinal fusion was added to this. In a follow-up examination of from one to nine years after operation, an excellent result was found in 77% of those treated surgically and a good result in another 16%. Results were not quite so good (60% excellent results, 28.5% good results) in 35 patients treated conservatively. Spinal fusion did not appear to affect the outcome. The authors suggest that operation is preferable in most patients with lumbar disc herniation.

(Continued on page 56)

MEDICAL NEWS *in brief*

Continued from page 55)

COBALT60 THERAPY

The June issue of the *Journal of the Canadian Association of Radiologists* contains a symposium on cobalt60 therapy, presenting the first five-year reports on the clinical applications of cobalt60 chemotherapy units to the treatment of diseases, largely neoplastic. The editor points out that these articles must be considered only as preliminary reports since clinical experience so far acquired can only indicate certain trends. It would seem that the main advantage of cobalt60 irradiation utilized for teletherapy purposes lies in the treatment of deep-seated lesions which could hardly ever be treated adequately with conventional x-ray therapy. It is not due to any special virtue of cobalt60 radiation, but is directly related to the greater penetrating power and scattering in a forward direction of such radiation. Excessive tissue reactions which force discontinuation of ordinary x-ray therapy can be avoided. It is too soon to say whether cobalt60 will improve results in treatment of neoplastic diseases over those obtained by conventional 200-300 kV radiation. But results may be improved if the cobalt60 radiation beam is made to deliver considerably larger doses than have been possible with other methods.

In the symposium Watson of Saskatoon reports on treatment of 942 cases of malignant disease by cobalt60 out of a total series of 3957 treated by various forms of radiation therapy. He finds that cobalt60 in telecurietherapy or therapy by other supervoltage apparatus is the method of choice in approximately 40% of patients requiring radiotherapy for malignant disease. Benefits likely to accrue are mainly related to lack of discomfort to the patient and absence of troublesome reactions rather than remarkable improvement in cure rates. Bennett and Walton of Winnipeg give statistics on a three-year experience of treatment in malignant disease, but withhold the forming of conclusions, beyond their impression that the cobalt beam is useful as a palliative instrument in cases for which conventional x-ray therapy would not have been so useful. Thomson and Smith of London, Ontario, present a study of oral carcinoma therapy after five years. They state that radiographic evidence of invasion of the mandible by tumour is not necessarily a contraindication to cobalt60 therapy and that recurrence of disease after x-ray therapy has been successfully treated by cobalt60, while adjacent solitary lymph node invasion if included in the treatment fields showed favourable initial regression. The optimal tumour response lies in the 6000-7500 r range delivered in four to six weeks. Skin reactions are less with cobalt60 than from conventional x-ray, but mucosal reactions are decidedly more variable. Some oral carcinomata are extremely resistant to cobalt60. The clinical response thus far goes well. Catton of Ottawa discusses the localization of tumours for cobalt60 circumaxial rotation therapy and Kornelsen of Ottawa discusses predetermined dose distribution for this therapy.

SUBSTERNAL ŒSOPHAGUS

At the Sklifosovsky Institute in Moscow over 500 operations have been carried out in the last ten

(Continued on page 58)

(Continued from page 56)

years for cicatricial stenosis of the œsophagus. During the past five years a preference has been given to fashioning a substernal œsophagus from small intestine; this is preferred to a subcutaneous artificial œsophagus, and in a recent article (*Khirurgia*, No. 5: 38, 1957) Petrov discusses results of 50 operations in 48 of which a substernal œsophagus was made from small intestine and in two of which it was made from the left side of the colon. There were four deaths, one due to bilateral pneumothorax and three due to necrosis of the small intestine. In seven cases the substernal site had to be abandoned for a subcutaneous one, leaving 37 cases in which the anastomosis passed through the anterior mediastinum. A side-to-side anastomosis of bowel and œsophagus is preferred, but was possible in only 11 cases.

CANADIAN CANCER SOCIETY: JOHN S. McEACHERN MEMORIAL FELLOWSHIPS

Applicants for these Fellowships must be graduates in medicine of an approved Faculty of Medicine or hold an advanced degree in physics from an approved Faculty of Graduate Studies; and (a) shall have already pursued postgraduate study in a field related to the diagnosis or treatment of cancer; (b) shall be endorsed by one of the Faculties of Medicine in Canada in order to augment the clinical anticancer program in the geographic area of its major influence; (c) shall under this Fellowship pursue further postgraduate study related to the diagnosis or treatment of cancer acceptable to the Advisory Committee on Fellowships of the Canadian Cancer Society; and (d) shall express a firm interest and assume the moral obligation to return to Canada to practise their profession subsequently, with a particular interest in cancer, preferably in the sphere of influence of the endorsing Faculty of Medicine.

The special study for which a Fellowship is requested shall be that for which opportunities are not already available within the

(Continued on page 64)

Intramedic®

Polyethylene Tubing*
now Sterile and ready to use

an electron beam – accelerated by 2 million volts – has charged through this package – your assurance of complete sterility

*animal tested

Your favorite dealer can fill your order promptly

Clay-Adams, Inc. 141 East 25th Street, New York 10

MEDICAL NEWS *in brief*

(Continued from page 58)

endorsing Faculty or affiliated teaching hospitals.

These Fellowships have an approximate value of $10.00 a day and are tenable for a maximum period of one year. An additional award at the rate of $400 per annum will be made to married Fellows. At the discretion of the Advisory Committee on Fellowships additional amounts may be made available for travelling expenses. Application forms may be obtained through the Dean of the respective Faculty of Medicine from the Canadian Cancer Society, 800 Bay Street, Toronto 5, Ont. Applications should be submitted to the above address not later than October 1 in any year.

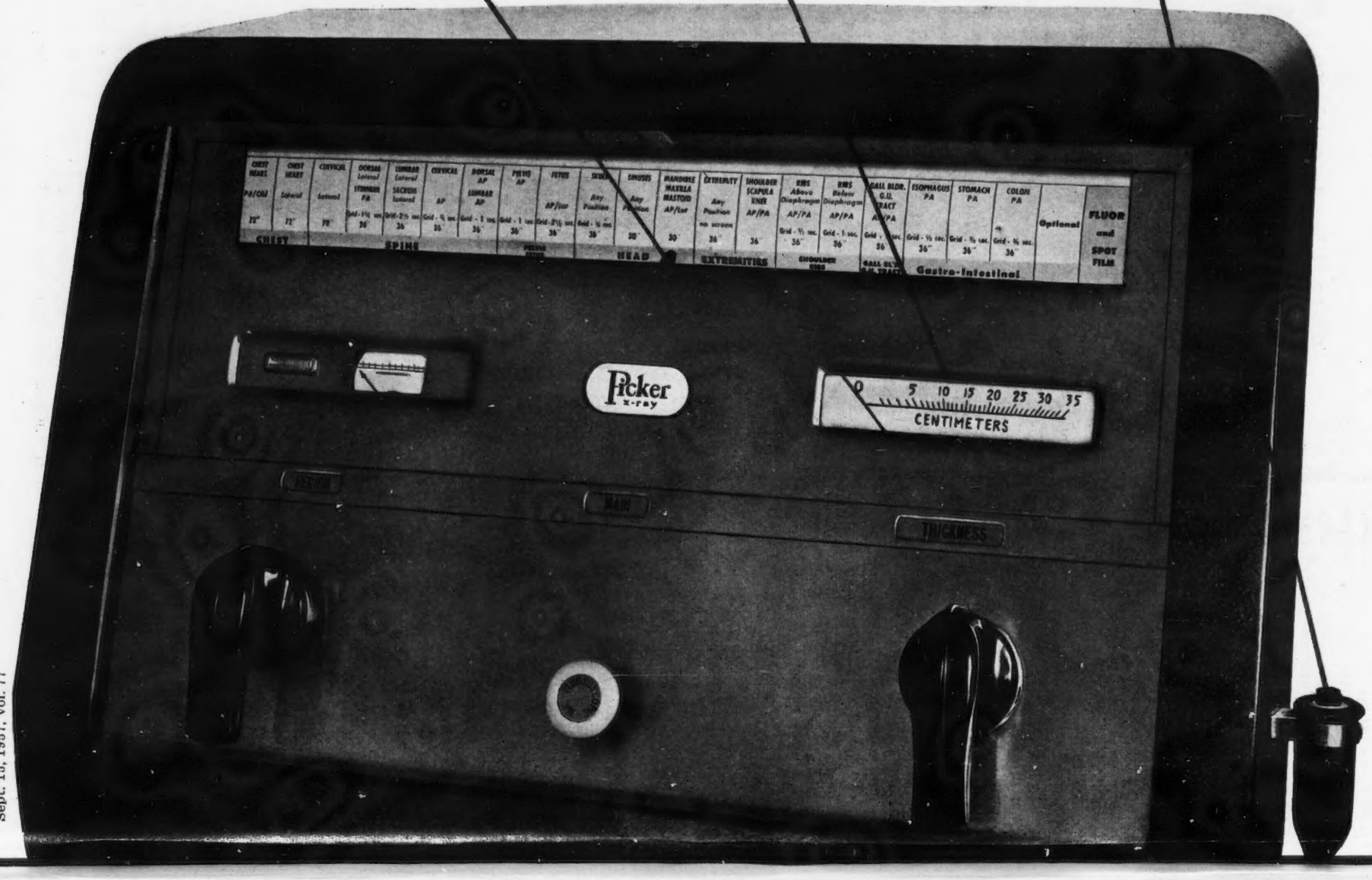
ABSTRACTS OF SOVIET MEDICINE

The Excerpta Medica Foundation of Amsterdam announce two new quarterly publications in their series entitled *Abstracts of Soviet Medicine*. The two publications will be divided into Basic Medical Sciences (Part A) and Clinical Medicine (Part B). The object is to facilitate interchange of medical information by giving informative abstracts on significant articles which have appeared in the Russian language. The heavy cost of translating and publishing these journals is to be aided by a grant from the National Institutes of Health, U.S. Department of Health, Education and Welfare. Part A (Basic Medical Sciences) will contain abstracts in the fields of anatomy, anthropology, embryology and histology; physiology, biochemistry and pharmacology; endocrinology; medical microbiology, immunology and serology; general pathology and pathological anatomy; cancer. Part B (Clinical Medicine) will contain abstracts in the field of internal medicine; pædiatrics; neurology and psychiatry; surgery; obstetrics and gynæcology; oto-rhino-laryngology; ophthalmology; dermatology and venereology; radiology; chest diseases; public health, social medicine and hygiene, infectious diseases; cancer. The annual subscription price to Part A or Part B is $15.00, with a combined subscription for Parts

(Continued on page 66)

Picker "Anatomatic" new way in x-ray

you can't help getting a "good picture every time" when you (1) dial-the-part, (2) set the thickness, (3) take it!



get the story from your Picker representative. You'll find him under "Picker X-Ray" in the classified section of your local 'phone book: or write us at 1074 Laurier Ave. West, Montreal, P.Q.

Canad. M.A.J.
Sept. 15, 1957, vol. 77

MEDICAL NEWS *in brief*

(Continued from page 64)

A and B of $25.00. Part A appeared at the end of May, and Part B is due to appear very soon. The format of Part A follows very closely that used in the other publications of *Excerpta Medica*. Abstracts on the whole tend to be longer than those used in other publications from this source, probably because of the difficulty of getting hold of the original articles. Titles are given both in Russian and in English, except those coming from one Moscow abstractor, which appear only in English. The first issue contains five different sections, the first on anatomy, embryology and histology, the second on physiology, biochemistry and pharmacology, the third (quite a long section) on endocrinology, the fourth on medical microbiology and the fifth on general pathology. It is interesting to note that the list of abstractors includes the late Professor Filatov, who appropriately enough abstracts one of his own articles in which he claims that physical work is not only a social but also a biological necessity, because it produces "biogenic stimulators" similar to the substance involved in Filatov's tissue therapy.

POSTOPERATIVE USE OF PANTOTHENIC ACID

In 1951 Jacques reported some good results from the injection of pantothenic acid in paralytic ileus, and a number of workers have since published material on the use of this vitamin in postoperative atony of the bowel. Schulte of Düsseldorf (*Deutsche. med. Wchnschr.*, 82: 1188, 1957) now reports studies in 82 unselected cases of laparotomy for various diseases. A double-blind test was carried out and the patients received immediately after operation and then every six hours afterwards the contents of one ampoule intramuscularly, containing either pantothenol or a placebo. The time was then measured until the appearance of bowel sounds, the passage of flatus and the passage of the first stool. Observers had no difficulty in identifying the three types of ampoule out of six which contained 500 mg. of pantothenol, the alcohol corresponding to pantothenic acid. Statistical tests were applied which showed quite clearly that pantothenol shortens the time of postoperative bowel atony, without side effects.

ALDOSTERONE EXCRETION AFTER OPERATION

After operation there is a prolonged period of sodium conservation with positive sodium balance. It has been suggested that this is due to the increased output of aldosterone after operation. Casey and his colleagues (*Surg. Gynec. & Obst.*, 105: 179, 1957) studied the following in postoperative patients: aldosterone content of urine, urinary 17-hydroxycorticoids, sodium, potassium and chloride levels in serum and circulating eosinophils, sodium and potassium content of urine and fluid obtained by suction drainage. They showed that in six patients maximum aldosterone levels in urine were found early in the postoperative period, and enhanced excretion did not persist throughout the period of positive sodium balance. Aldosterone output was not correlated with plasma sodium or other ions. Any secondary fall in plasma sodium did not increase aldosterone output. It is therefore suggested that aldosterone is not entirely responsible for the sodium

(Continued on page 68)

MEDICAL NEWS *in brief*

(Continued from page 66)

conservation, but may act only as a trigger mechanism. Possibly a direct stimulation of CNS centres is the mechanism involved.

RUMANIAN MEDICAL REVIEW

The one and only medical publishing house in Rumania, assisted by the Documentation Centre of the Board of Health, has begun an effort to make the results of Rumanian medicine known outside the country. A quarterly review known as the *Rumanian Medical Review* has made its appearance and has its editorial office in Bucharest (7 Aristide Briand). The first issue consists mainly of long abstracts in English of articles from the medical press of Rumania, together with some book reviews. All aspects of medicine are covered, but the longest article in the first issue refers to the control of a long-standing problem in Rumania, endemic goitre. Surveys were made by specialized units, and local physicians and health authorities were given educational courses by visiting teams. In 1948-1949, iodization of salt was started; later tablets containing 1 mg. of potassium iodide were distributed free of charge to children, pregnant women, nursing mothers and volunteers. Treatment of developed goitre was also undertaken. It is claimed that during the seven years of control action the morbidity rate in goitrous areas has decreased by 20-35%. Readers of this Review may find the English a little quaint, but it will give some insight into what is happening in a country from which little medical news is at present available.

PHENYLBUTAZONE TREATMENT OF THROMBOPHLEBITIS

Höst of Oslo, Norway, (*Tidsskr. norske laegefor.*, 77: 423, 1957) reports his results of the treatment of 25 cases of thrombophlebitis, 17 superficial and eight deep, with a daily dose of 400-600 mg. phenylbutazone (Butazolidine) for an average of five days. The response was good in 14 cases of superficial thrombophlebitis, but negative in eight cases of deep thrombophlebitis. Criteria for improvement included rapid fall in temperature, and alleviation of pain, swelling or weakness in the course of three to four days. In two cases simultaneous anticoagulant therapy made the reason for the improvement doubtful. Two cases of skin rash developed, but it disappeared within a few days.

CIBA MEDICAL RESEARCH FELLOWSHIP

The Ciba Company Limited, Montreal, has announced the award of the first Ciba Medical Research Fellowship to Dr. A. J. Blair. The Fellowship has a value of $3000 and covers a period of one year up to June 30, 1958.

Dr. Blair will be carrying out research in the field of adrenocortical physiology at the Royal Victoria Hospital, Montreal, under

(Continued on page 70)

MEDICAL NEWS *in brief*

(Continued from page 68)

Dr. John Beck, Chief of the Endocrine-Metabolic Service. Dr. Blair has just completed a year as Teaching Fellow in Internal Medicine at this hospital.

Dr. Blair was born in Philadelphia in 1923, and received his medical degree from Cornell University Medical College in 1951. His postgraduate training has included one year in pathology at the New Haven Hospital, New Haven, Connecticut, and three years in internal medicine in Minneapolis, Minn., Columbus, Ohio, and Montreal.

GASTROENTEROLOGICAL CONVENTION

The 22nd Annual Convention of the American College of Gastroenterology will be held at The Somerset in Boston, Mass., October 21-23, 1957.

In addition to the many individual papers to be presented, there will be panel discussions on chronic ulcerative colitis, diseases of the œsophagus, peptic ulcer, and the management of massive gastrointestinal hæmorrhage in patients with liver disease. There will again be scientific as well as commercial exhibits and the sessions will be open to all physicians without charge. On October 24, 25 and 26, immediately after the Convention, Dr. Owen H. Wangensteen of Minneapolis, Minn., and Dr. I. Snapper of Brooklyn, N.Y., will again be the moderators of the Annual Course in Postgraduate Gastroenterology. Attendance at the course will be limited to those who have registered in advance.

This year marks the twenty-fifth anniversary year of the College and silver certificates are to be presented to those who have been affiliated with the organization since its inception.

Honorary Fellowships are to be presented to Dr. Chester S. Keefer, Boston, Mass., Dr. William W. Frye, New Orleans, La., Dr. Stafford L. Warren and Dr. Rafe C. Chaffin, both of Los Angeles, Calif.

Copies of the program and further information concerning the Postgraduate Course may be obtained by writing to: American College of Gastroenterology, 33 West 60th St., New York 23, N.Y.

POSTOPERATIVE PNEUMOPERITONEUM

In a Russian hospital, Esperov (*Khirurgia,* No. 3, 48, 1957) studied postoperative pneumoperitoneum by repeated radiography. As the result of study of 39 operations for acute abdominal conditions and 20 for chronic conditions, he shows that the amount of air remaining in the abdominal cavity after laparotomy depends on the site and length of the abdominal incision, more air remaining after laparotomy. The volume of the potential space under the diaphragm is 50-75 c.c.; amounts less than 100 c.c. are probably not radiographically visible. One hundred to three hundred cubic centimetres is absorbed in three to six days and larger quantities in five to 14 days. If ascites is present, absorption is slower. The presence of air seems to have no ill effects.

AMERICAN PSYCHOSOMATIC SOCIETY FIFTEENTH ANNUAL MEETING

The American Psychosomatic Society will hold its 15th Annual Meeting at the Netherland Hilton in Cincinnati, on Saturday and Sunday, March 29 and 30, 1958. The Program Committee would like to receive titles and abstracts of papers for consideration for the program, no later than November 15, 1957. The time allotted for presentation of each paper will be twenty minutes.

Abstracts in octuplicate should be submitted for the Program Com-

(Continued on page 71)

MEDICAL NEWS *in brief*

(Continued from page 70)

mittee's consideration, to the Chairman, Dr. Theodore Lidz, 551 Madison Avenue, New York 22, New York.

R.A.M.C. IN PORT SAID

Three medical reservists report (*Practitioner*, 179: 191, 1957) on their experience in action during the 47-day campaign by the British and French forces in the area of the Suez Canal in the fall of 1956. The authors were called on active duty in August 1956. After some weeks of waiting during which they practised the loading of casualties into helicopters, they gradually gathered the impression that they would never leave England. However, at 24 hours' notice their field ambulance was flown to Malta and on the same evening they were at sea in assault ships. Their company was ashore ten minutes after the beginning of the assault on November 6. On the first day of action they looked after approximately 70 British casualties, none of whom were held by the field ambulance for more than 30 minutes before being evacuated by helicopters to aircraft carriers lying off shore. Each helicopter was able to take four patients and one attendant at each flight. Later more Egyptian casualties arrived and the unit commandeered a hotel, turned the ballroom into a ward, the kitchen into a morgue, the bar into an operating room and the lobby into an outpatient department. These makeshift measures gave rise to the usual incongruous sights seen in wartime such as the collection of soiled dressings in the champagne buckets of the hotel dining sets. No blood was available for transfusion until the second day of operation. After the cease-fire order, this unit became an acute surgical hospital for Egyptian wounded. When one considers that power or running water were not constantly available, an idea of the resourcefulness required for operating in such circumstances will be obtained. The casualties were both civilian and military. It was not always easy to distinguish between the two as the military were often without uniforms and the civilians frequently armed. After a few days, liaison was made with the Egyptian civilian hospitals and medical personnel. Later the duties of the unit included visiting the P.O.W. camps, the prisons of bomb-throwers and curfew-breakers and the detention barracks where important underground leaders had been assembled. Some house calls were even made.

It is remarkable to observe that no postoperative death from infection was recorded, probably because of the routine administration of tetanus antitoxin and gas-gangrene antitoxin, with 1,000,000

(Continued on page 72)

MEDICAL NEWS *in brief*

(Continued from page 71)

units of crystalline penicillin, to all admissions. There was also little dysentery or infectious disease, which is a credit to the sanitary measures enforced. These medical officers had a great deal of respect and admiration for the use of helicopters in evacuating wounded. They suggest that morphine be issued more often in ampoule syringes and that elastic bandages for shell dressings should replace the woven ones now available.

MEDICINE AND WINE

What looks like one of the most agreeable medical congresses of the year is scheduled to take place in Bordeaux, France, on October 11, 12 and 13, 1957. It is described as the International Medical Congress for the Scientific Study of Wine and Grapes. It is under the presidency of a well-known figure in French medicine, Professor Georges Portmann, Honorary Dean of the Faculty of Medicine and Pharmacy of Bordeaux, and is open to physicians and pharmacists. The object of the Congress is stated to be "a contribution to combating alcoholism". Two questions are scheduled for general discussion—wine and alcoholism, and wine and health. The physiological and bacteriological qualities of wine from various regions will also be discussed. The date of the Congress has been purposely arranged for the vintage season, and we are informed that "scientific documentation sessions" will be held during the Congress in various wine-growing areas around Bordeaux. To this tempting program are added such attractions as an official banquet at the Château des Ducs d'Epernon and a gala night at the Grand-Théâtre de Bordeaux. Physicians interested in wine can obtain further information from the Congress secretary, Dr. Rotges, 36 avenue Arès, Bordeaux, France.

POSTGRADUATE COURSE ON MANAGEMENT OF INFECTIONS

The University of Buffalo School of Medicine announces a short postgraduate course on management of infections, October 2 and 3, 1957. Recent advances in the prevention, diagnosis and treatment of a wide variety of infections will be presented in this course with major emphasis on correlation of laboratory and clinical findings. The fee for the course is $30.00. Information from Milton Terris, M.D., Assistant Dean for Postgraduate Education, University of Buffalo School of Medicine, 3435 Main Street, Buffalo 14, N.Y.

RARE MANIFESTATIONS OF TUBERCULOSIS

In a symposium on rare manifestations of tuberculosis, members of the staff of the Mayo Clinic (*Proc. Staff Meet. Mayo Clin.*, 32: 373, 1957) report five unusual cases of the disease, in which treatment led to a successful outcome. The first patient came to the Clinic in January 1951 complaining of hoarseness and pain in the right side of the throat and tongue, treated by physicians unsuccessfully for three years. He had a red ulcerating tender mass on the lateral and dorsal aspects of the posterior part of the tongue and also severe laryngeal infection. Smears of sputum contained acid-fast bacilli and a biopsy of the tongue lesion showed a chronic granuloma with caseation. Chest radiography disclosed miliary tuberculosis. Chemotherapy for tuberculosis relieved his condition in three weeks.

The second case is that of a woman who complained of gradually increasing nasal obstruction for 13 years, with mucopurulent, blood-tinged or watery nasal discharge. Biopsy of the œdematous mucosa revealed a caseous granuloma. Cultures were positive for acid-fast bacilli. Antituberculous chemotherapy gave a gratifying result, for within six weeks the patient was able to breath through her nose without difficulty for the first time in many years. After eight months of treatment the nasal mucosa was almost normal.

The third patient had a chronic cough and was found on bronchography to have a tuberculous stricture of the bronchus. The tuberculous left upper lobe was resected and the stricture in the left bronchus with it. The bronchus to the lower lobe was then anastomosed to the proximal stump of the bronchus. Chemotherapy was commenced and the end result was excellent.

The fourth case was an example of a lesion now rare, known as tuberculous dactylitis, which developed as a slightly tender fusiform swelling of a finger which ulcerated, and was associated with a similar swelling of a thumb, the dorsum of a wrist and an elbow and a cheek. Chemotherapy for tuberculosis ultimately resulted in healing of all lesions.

The last case mentioned is that of a physician who cut his thumb at necropsy and later developed a primary inoculation tuberculosis of the thumb. Chemotherapy was delayed for three months and was then only partially effective. Surgical treatment with ulcer excision and skin grafting was required.

ORALLY ADMINISTERED ATTENUATED POLIOVIRUS VACCINE

In an address to the Fourth International Poliomyelitis Conference, in Geneva this summer, Dr. Sabin of Cincinnati summed up the situation as regards poliomyelitis vaccination with killed-virus vaccine and with live attenuated virus

(Continued on page 75)

MEDICAL NEWS *in brief*

(Continued from page 72)

vaccine as follows (*J. A. M. A.*, 164: 1216, 1957).

"The marked reduction in the incidence of paralytic poliomyelitis achieved thus far by killed-virus vaccine may justify the decision that, in countries where mass application of killed-virus vaccine is feasible, it should be given an opportunity to show what can be achieved over a period of years. If the passage of time should prove that immunity resulting from the killed-virus vaccine, supplemented in at least some individuals by natural infection, is indeed long-lasting, there would never be any need for considering the use of a live-virus vaccine. If time should prove that the immunity conferred by a killed-virus vaccine is of relatively short duration in a large proportion of individuals, consideration may then be given to the feeding of the best available attenuated vaccine rather than waiting for the uncertainties of natural infection to implement the waning immunity.

"Others, however, may reach a different decision based chiefly on the following considerations: (1) The effectiveness of killed-virus vaccine is at best only about 75%. (2) The demonstration that after infection by the oral route there is no accelerated antibody response in previously sensitized individuals suggests that there is no basis for expecting long-lasting immunity from a killed-virus vaccine. (3) The demonstration that killed-virus vaccine does not alter the susceptibility of the intestinal tract to infection and does not influence the dissemination of polioviruses in the community suggests that these viruses would continue to be a threat to those who lose their immunity. On this basis it may be concluded that the philosophy of waiting for the passage of time to determine the duration of killed-virus vaccine immunity might deprive large numbers of individuals of protection against paralysis, which earlier trials of an orally administered live-virus vaccine may provide. The decision is obviously not an easy one.

"In other countries, however, where mass application of a killed-virus vaccine is not feasible for economic or other reasons and in which polioviruses of varying degrees of virulence are already known to be undergoing extensive spread in the population, tests of the currently available highly attenuated, orally administered vaccine in progressively increasing numbers of people would appear to be justified."

COURSE IN PHYSICAL MEDICINE AND REHABILITATION

The University of Buffalo School of Medicine announces an extensive course in physical medicine and rehabilitation to be held in various Buffalo hospitals on 20 Wednesdays, beginning October 2, 1957. The course will involve a full day's work each Wednesday up to and including Wednesday, March 12, 1958, and is planned to give the physician an understanding of the techniques employed in physical medicine and the varied skills and methods used in the rehabilitation of disabled persons. Practical experience with patients is stressed and the course is limited to five physicians. Information from Milton Terris, M.D., Assistant Dean for Postgraduate Education, University of Buffalo School of Medicine, 3435 Main Street, Buffalo 14, N.Y.